Honduras Effective and Sustainable Water Management (MESA) Program Design

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Water IQC Task Order
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Development *Alternatives,* Inc.

MESA Program Design

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MESA Program Design

I. Background

Water is the most critical natural resource in Honduras, and poor water resources management has resulted in major social, economic, and environmental problems. Honduras suffers from inadequate supplies and quality of drinking water, inefficient irrigation practices in high value agriculture, sub-optimal generation of energy, sewage related health problems, flood damage and losses, periodic droughts, and degradation of important marine and freshwater ecosystems. Improved management to increase sustainable access to water is thus expected to result in notable improvements in human health, economic growth, ecological integrity, and overall quality of life.

USAID/Honduras has concluded that a holistic approach towards water resources management can best address these problems by balancing complex tradeoffs among water use sectors, and fostering management solutions that improve economic growth while ensuring maximum benefit to human beings and guaranteeing the health of ecosystems. USAID also considers that an integrated approach provides many opportunities to take advantage of programmatic intersections and possible areas of additional synergy across its current portfolio of activities in Honduras.

The Mission is preparing to launch a first phase of activity which will focus on the Choluteca and Rio Negro Basins, comprising the land area, freshwater aquatic, and coastal/estuarine environments located in the drainage area of the Rio Choluteca and Rio Negro rivers of southern Honduras. It will encompass the communities, municipalities, farming systems and industries of the same area. The selected region corresponds to USAID's identification of the southern corridor as a primary zone of intervention for its development efforts.

USAID/Honduras has developed a new strategic concept paper for the period 2004-2008 as well as a program description for a new water activity – MESA, *or Manejo Efectivo y Sostenible de Agua* - highlighting the major issues, linkages involving water use across the different sectors and identifying areas for strategic intervention by the Mission. The MESA program description explores the potential role of technology application, policy responses, institutional reform and governance as parts of an effective strategic approach for USAID in helping Honduras better manage its water resources. The draft of the Concept Paper for the 2004-2008 Strategy and the MESA New Activity Document are included in Annex I.

In order to finalize the rationale, framework and direction for an integrated project, the Mission undertook a MESA design exercise during August 2002. It expressly addressed the sustainable development needs of the Choluteca region, looking at water use across all sectors and among the varying actors and stakeholders and at differing scales of intervention – local, regional and national institutions. The exercise included an extensive review of the previous work in watershed and integrated water resources management. It reviewed the current water resources related programs in Honduras funded by several other international organizations and examined the institutional capacity at all levels to host and undertake new programming in the sector.

This MESA Project Design Document presents the combined findings and recommendations of the USAID/Honduras design team. The MESA design included here represents a synthesis of the potential project elements in a way that best builds on the Mission's past experience, current programming and new directions. The design takes into account the significant lessons drawn from the Mitch rehabilitation efforts. It is proposed within the established limits of both USAID's resources and local institutional capacity and priorities. The MESA design specifically responds to the questions where it should focus, how it should best be implemented, with and through which qualified partner institutions and why theses interventions are the best choices for USAID/Honduras. See Annex I for a copy of the MESA Design Task Terms of Reference.

II. Problem Statement

The previous USAID/Honduras documents written to help elaborate the MESA activity present an outstanding description of the existing context, problems and challenges to improved or integrated water resources management. The MESA New Activity Document (Annex I) includes a thorough description of the status of water management at all levels. Interested readers are referred to that discussion for further detail. In summary, the three major issues to address in managing this most critical resource in Honduras are:

- **Water Scarcity –** Demand for water surpasses availability at every level – urban and rural, agriculture, industry, energy production and fisheries. Poor households devote enormous resources (time and money) to securing adequate water. Agriculture production, and hence economic development, is constrained by access to sufficient quantities of water. Energy production suffers from poor management of watersheds and reservoir systems. Water scarcity threatens the fragile saline balance of the aquatic and marine ecosystems upon which significant economic investment and development hinges.
- **Degraded Water Quality –** Where water is available, it is frequently contaminated by agriculture, industrial or urban domestic pollutants. Inadequate sewage treatment poses a large risk in many watersheds. Economic activity is hampered by the lack of clean water or the increased treatment costs to acquire it. The fisheries and aquaculture industry faces threats from agro-chemical and urban waste pollutants.
- **Extreme Events –** Periodic floods and drought both pose significant risks for the food security and economic development of the country. Hurricane Mitch (1998) brought catastrophic flooding from which the people and economy are still recovering. Drought is a relatively frequent occurrence, especially in the arid southern regions. Even normal rainfall years can result in an uneven distribution over time, resulting in dry periods and the loss of crops as seen in the Choluteca basin in 2002.

There are numerous underlying causes that drive or exacerbate these three main problems. They include elements beyond USAID's control such as the changes in climate at the regional level or the increasing population pressures. However there are seven particular root causes which an integrated water resources management program can address:

1. **Inadequate policy, institutional and legal framework:** laws, policies and institutional structures have to align with the realities of the natural resource, local capacities and recognized priorities;
2. **Lack of governance capacity:** local governments have little experience in participatory governance and an extremely limited capacity to undertake meaningful local management;
3. **Low public awareness:** the Honduran citizenry does not fully understand the profound problems associated with water management and fails to act in concert to resolve critical issues;
4. **Inadequate information base:** hydrologic information is sparse and fragmented among multiple institutions and is not being used to solve real development problems;
5. **Lack of access to and application of technology and best practices:** appropriate and cost-effective technologies have not gained the extensive use that would have a beneficial impact;
6. **Lack of financial resources:** resources are severely lacking to build new water works and the financing of even the operation and maintenance remains a huge challenge in most localities;
7. **Absence of political will for reforms:** Turnover in local and national leadership results in a short-term approach to solving problems and little incentive to tackle the complicated long-term solutions.

These problems and underlying causes frame the challenges for MESA and highlight the opportunities for the MESA design. The proposed solutions and activities lie directly within the contextual setting.

III. MESA Project Design

A. The Strategic Framework for MESA

The MESA design that follows is proposed within the framework of the Mission's evolving Strategic plan. The MESA New Activity Document, the Concept Paper for the FY 2004 – 2008 Strategy and the signed Strategic Objective Agreement with the Honduran Government are the basis for the formulation that follows. It has been developed with additional discussions with the Mission and is consistent with its expected longer term plans, current programmatic objectives and resources available to support and manage this activity.

Strategic Objective: **Sustainable management of watersheds, forests and protected areas**

This SO is extracted from the signed government agreement for the execution of the MESA program (August 2001). The final adoption of this formulation will depend on completion and approval of the Mission Strategy. This is likely to be concluded contemporaneously with the initiation of MESA activities. Differing constructions of the eventual country strategic plan will require the Mission program staff to adjust and modify this MESA framework according to those new directions.

MESA Program Objective: **Improve the management and use of water resources**

The stated objective is derived from the MESA New Activity Document developed by USAID/Honduras. The emphasis of the program objective is on integrated water resources management that expressly incorporates a holistic approach applied to multiple interventions and with key actors at the appropriate scale.

Intermediate Results:

I. Increased access to and application of technology for sustainable water use and management

II. Strengthened local capacity for water resources management

III. Improved environmental education and awareness of water resources management

IV. Improved legal and policy framework for water resources management

The Intermediate Results (IRs) have been largely developed in the original MESA New Activity Document. The MESA design exercise adjusted the IRs slightly in wording for internal consistency and to better reflect the recommended ensemble of activities associated with them. The full description of all of the recommended activities follows further below.

B. MESA Design Principles

In addition to being congruent with the Mission's strategic objectives as discussed above, the MESA design required specific attention to be paid to some overarching design principles. The MESA TOR for the Design Activity included a set of design principles and the MESA New Activity document also elaborated design principles and further selection criteria. These include principles related to sound technical design as well as those based on the priorities of USAID and its programmatic prerogatives. This document has tried to incorporate the essentials of all of these recommendations into its final design. For the purposes of clarity and presentation, the four essential (consolidated) design principles are discussed here in the MESA context.

1) Builds on past activities – The government of Honduras agencies, USAID and other important international donors and institutions have been executing natural resources management programs in general, and numerous watershed and water resources management projects in particular, for almost 30 years. This translates into a wealth of lessons learned and accumulated experience upon which the MESA design can be founded and launched.

From 1981 – 1988 USAID supported the Natural Resources Management Project which focused on the Choluteca River. The principal local institution was the Ministry of Natural Resources, which gave the project a definite agricultural focus. This gave way to the Land Use Productivity Enhancement (LUPE) project, which was essentially an extension project for hillside farmers. Watershed management was reduced to municipal-level micro-watershed protection plans. Emphasis was on mulching, live barriers, and agroforestry practices using contact farmers and demonstration farms.

The IDB-financed Cajón watershed management project began operations in 1995. It borrowed heavily on the LUPE experience in terms of methodology, technology and personnel. However, it had a watershed focus, with much more importance being given to natural forest management. Local communities were also given a more participatory role in the selection and contracting of technical service. It recently published its *Accumulated Experiences in Watershed Management Projects* (Feb 2001), included in Annex II that summarizes its lessons learned in Nicaragua, Guatemala, El Salvador and Honduras.

The recent Hurricane Mitch recovery and rehabilitation work is an excellent case in point. The USAID-funded Upper Watershed Rehabilitation project documented a wealth of important findings on watershed and water resources management (included in Annex II – Critical Design Documents). The Pan American Agriculture School (Zamarano) published its own evaluation of the work with the municipalities in the same project (included in Annex II).

A very recent project undertaken by USAID El Salvador, with its cooperating NGO partner (CARE) offers the MESA design some important experience. The AGUA – Aceso, Gestion y Uso Raciona del Agua) – Project shares many of the design features with MESA. It is completing three years of implementation and the final evaluation is in progress as this is written. Both the USAID El Salvador Mission and the USAID/LAC Bureau have been extremely satisfied with the results.

Finally, individual professionals have worked extensively in watershed and water resources management in Central America for many years. One of these, Henry Tschinkel, has authored two publications of notable importance for the MESA design. The first, *Considerations for Orienting Future Assistance in Watershed Mangement* (Oct 2001) was commissioned by the Honduras Mission. The second, *What Really Works in Watershed Management?: Some Lessons for Guatemala* (Oct 2001) was prepared for the USAID Guatemala office. Both are included in full in Annex II.

The MESA design work has strived to integrate this experience and the significant recommendations into its proposed implementation plan.

2) Develop an integrated water resources management approach – The MESA design is equally founded on the objective of addressing water resources management in a holistic, fully integrated sense. There are two specific elements to this integration.

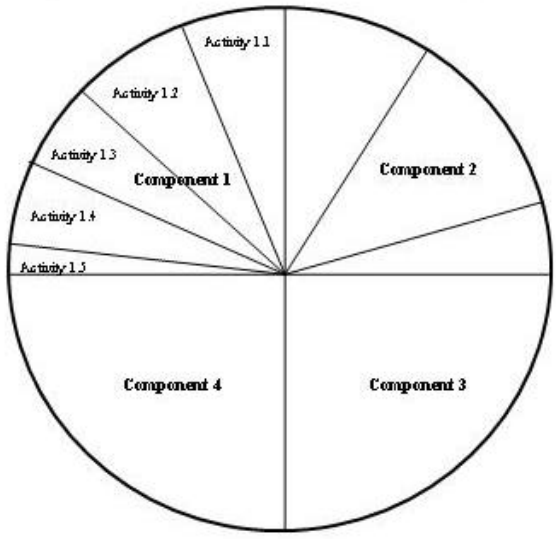
First, this approach obliges the project to work with a range of issues that comprise the larger challenge of improving water resources management. MESA will achieve this by carefully including activities under its four core IR packages (or components):

- Increased access to and application of technology for sustainable water use and management
- Strengthened local capacity for water resources management
- Improved environmental education and awareness of water resources management
- Improved legal and policy framework for water resources management

The proposed activities below are highly complementary to this approach and highly interdependent. The design presumes that this combination of actions will have an important positive and measurable impact in the watershed and that the results will serve as real models for future work.

The second element of this integration applies to the management of the Mission's portfolio of programs. Development of the MESA activity was driven in part by an effort to bring its different program offices and teams together around a single concerted intervention – in this case using water as the powerful motivating feature across the activities. To a large degree this has been accomplished in the design. The figure below depicts MESA as an ensemble of components, each with some specific activities and tasks. All of them are interconnected. They involve most of the Mission's important programs: Natural Resources, Municipal Development, Health, Education and Economic Development. It is important to note that while the components and activities proposed for MESA do **not** represent a full treatment of everything that can be undertaken in the water resources sector, they do represent a complete range of interventions within the USAID/Honduras context – its strategic plan, previous experience and current resource levels. USAID has an opportunity, through its program development mechanisms, to be attentive to the MESA program and direct other activities and other funding (from the MDDI or Health offices, for example) towards achieving MESA's objective(s) in a concerted and proactive manner.

MESA Design Concept
Integrated Water Resources Management



The diagrammatic wheel above represents the ensemble of proposed MESA activities as part of an integrated treatment of water resources development in the Choluteca Basin. Working on any of these elements will advance water resources management in the Choluteca basin. Working on many, in a directed fashion, will have a significantly greater impact. Working on all of them, concurrently, will significantly increase the sustainability of each part of the package. USAID/Honduras has a unique opportunity to draw upon the synergies of the existing portfolio to help make this happen with only incremental new funding expressly for MESA.

- The mission MDDI programs have a good record of municipal development work and are actually active now in a few of the Choluteca municipalities. Incorporating the MESA program into some of these areas is a natural extension. Having MESA draw upon MDDI's existing experience and using its implementing partners would be likewise make it much stronger in its own work.
- The Health Office programs (of HRD) have a long and successful record of implementing water supply and sanitation programs, mostly of the rural and peri-urban kind that characterize MESA. It has an excellent relationship with SANAA. Clearly their participation would also strengthen MESA.
- The Environmental Office has a newly developing relationship with the G/CAP mission's PROARCA II environmental pollution control program. MESA should establish working relationships with PROARCA to draw upon their expertise in a critical area of MESA's work.
- The ANR office (ANRO), the cognizant technical office for MESA, likewise implements considerable economic development activities through its agriculture development programs. The FINTRAC project is an small example of this. MESA should expressly work closer with the productive economic portfolio, especially in its irrigated agriculture activity, to realize completely its potential of reducing water use, increasing production and improving livelihoods.

3) Municipal and inter-municipal levels of intervention – The issue of counterparts and organizational partners, specifically at which level to focus the institutional strengthening efforts, is of crucial concern to MESA. Previous USAID experience and interests, coupled with major interventions by other donor programs at other levels, drive the MESA design to strongly targeting the municipal governments and local organizations as the preferred institutional partners. MESA will identify and work with the most appropriate Honduran counterpart institutions at the national level, especially in the aspect of overall program coordination, but it will concentrate its efforts at the municipal level – the indispensable point for specific actions to improve water resources management within the watersheds.

Within this precept – local focus – lie two opportunities for MESA's activities. The first is the municipality itself. The experience in local governance and the capacity to manage local activities varies hugely among the Choluteca basin's 44 municipalities – from the obviously sophisticated urban center of Francisco Morazan, to the small but strong municipalities like Moroceli, down to Soledad, a poor and relatively overlooked municipality in the dry zone of the basin. Several have declared protected areas within their jurisdictions and most have established natural forests. Many of these institutions have initiated Environmental Management Units (UMAs). Others have more informal structures managing water supply systems or development activities in general. These communities and their nascent organizational structures, with some initial experience under their belts, represent a unique opportunity that MESA will pursue to help achieve its objective(s).

The second opportunity lies within the recent tendency for multiple municipalities to associate for the purposes of addressing a common problem. In Honduras, these organizations are referred to as *mancomunidades*. They can be formally recognized, or chartered, and play key roles in resolving local natural resource management problems or for coordinating overlapping development activities. Two *mancomunidades* merit strong consideration by MESA. There are the nine municipalities in the Yusguare sub-watershed (Zamarano Valley) and the five (???) in the Guanacaure sub-watershed (southern Choluteca

basin and divide with the Rio Negro). MESA will support these and other growing inter-municipal governance structures as a way of fostering the improved water resource management throughout the basin.

4) A specific geographic focus: Choluteca and Rio Negro Basins – There exists ample opportunities and tremendous need to support improved water resources management across the breadth of Honduras. And indeed, there is support to do so coming from many different quarters, including USAID. The USAID Mission took the decision early on to focus the MESA design and subsequent activities on the Rio Choluteca and Rio Negro Basins. This corresponds to its stated objective of mounting concerted programs in specific regions of the country. In this case, the two basins correspond to USAID's southern corridor priority zone.

Even if we use the basins as a principle target area, the area it covers is very large and comprises several distinct agro-ecological zones, many different land use and production systems, over 40 municipalities (rural and urban), including the national capital Tegucigalpa and over 1,300,000 inhabitants. In the case of MESA, there is a clear need to focus its programs on the areas of greatest need, the regions water resources priorities and the activities with highest potential to demonstrate the value its approach and results. This section summarizes the design team's review and recommendations about the precise geographical focus of MESA within the larger river basins.

Agro-Ecological Zones of Importance

For analysis purposes the Choluteca and Rio Negro watersheds were divided into 6 agroecological zones: the Tidewater Zone, the Coastal Plain, the Lower Dry Zone, the Guanacaure-Río Negro Zone, the Mid-Watershed Zone and the Headwaters. Although the size of the agroecological zones is considerable, each one tends to have its own pattern of land use and particular problems. For example, the coastal plain is mainly used for sugar cane, melon production and pasture and its current problems revolve around the scarcity of water for irrigation. All the municipalities in the Lower Dry Zone have been very seriously affected by the recent drought.

Land Use in Farms per Agroecological Zone

Agroecological Zone	Annual	Permanent	Pasture	Fallow	Forest	Other
Headwaters	18.4%	4.7%	31.5%	16.5%	26.8%	2.1%
Lower Dry Zone	17.0%	1.1%	53.5%	24.6%	3.4%	0.4%
Mid-Watershed Zone	11.2%	5.1%	46.1%	14.7%	21.2%	1.7%
Guanacaure-Río Negro	23.1%	4.9%	51.6%	14.3%	5.1%	1.0%
Coastal Plain	14.0%	21.0%	38.9%	20.0%	0.8%	5.3%

(calculations based on Agricultural census 1993 and population census 2001)

In terms of size, the largest agroecological zone is the Mid-Watershed Zone. However, the Headwaters is more important in terms of population and the Coastal Plain contributes more to the GNP.

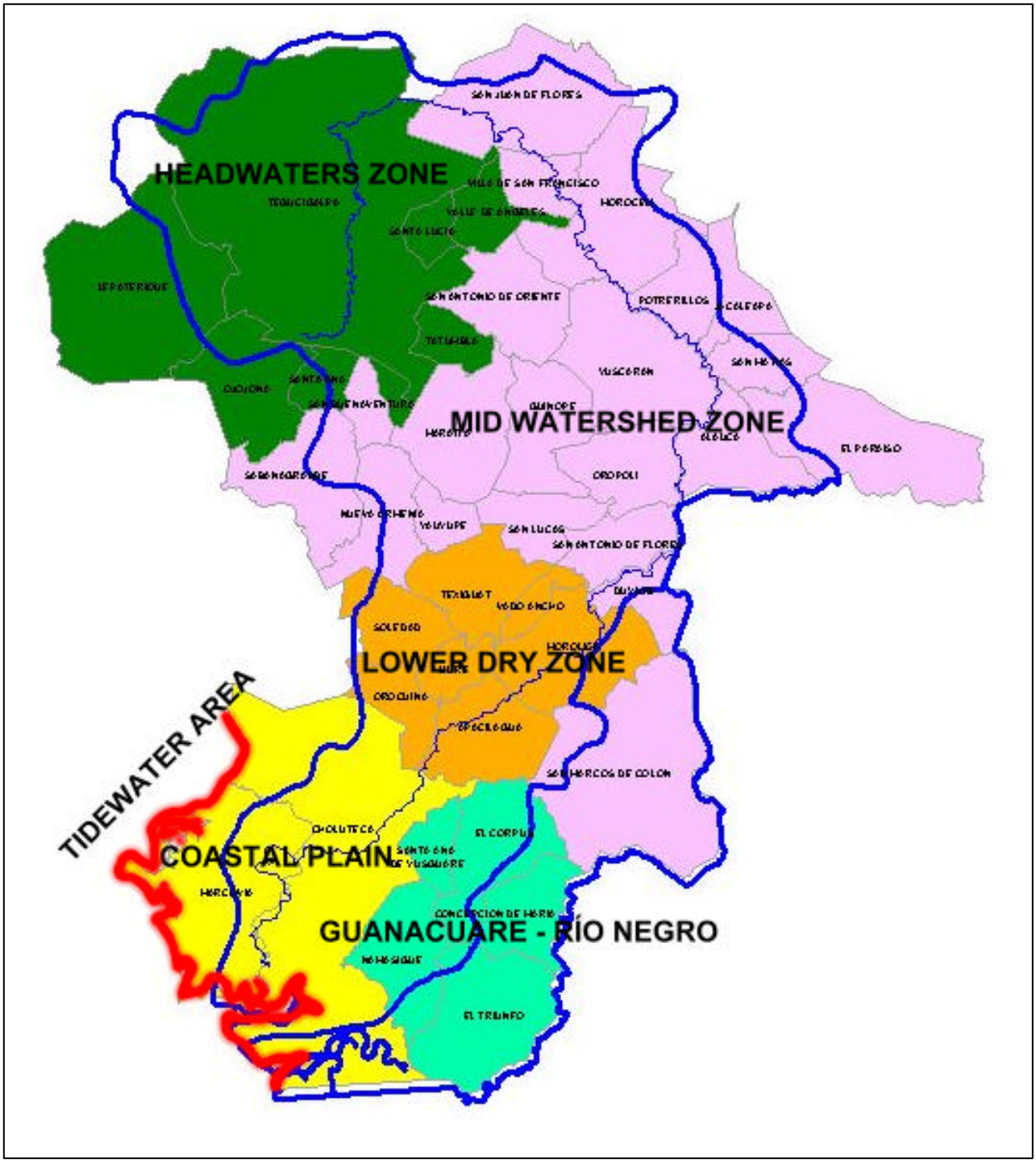
Farm number and Area per Agro ecological Zone

Agroecological Zone	Area (Km2)	Population	Farms (No.)	Area in Farms (Ha.)
Headwaters	1800	880,551	4109	28,510
Lower Dry Zone	1123	60,827	5741	44,386
Mid-Watershed Zone	3460	130,627	11779	176,135
Guanacaure-Río Negro	1207	118,933	10617	72,906
Coastal Plain	1233	156,857	3582	90,059

(calculations based on Agricultural census 1993 and population census 2001)

Note: The total area of land in farms, as reported in the 1993 agricultural census, represents only 46% of the total land area within the watershed. The difference is due to general under-reporting of land area by owners to the census officials, national forest land and urban properties.

Agroecological Zones



Protected Areas of Importance

The Rio Choluteca basin is rich in biodiversity and has some exceptional pristine areas that contribute immeasurably to the water resources of the region. Of the six legally declared protected areas, the MESA activity will concentrate on three – Yerba Buena, Montserrat and Guanacaure. The remaining three – La Tigra, Uyuca and the coastal mangrove zones (multiple areas) – will not form part of the MESA program. This is because that each of these areas has a significant source of technical assistance and associated funding already available. In the case of La Tigra, the Fundación Amigos de La Tigra (AMITIGRA) is providing services, some with existing USAID funding. For the Uyuca Biological Reserve, the Pan American Agriculture School (Zamarano) is providing services and funding. And in the Gulf of Fonseca, There are two strong NGOs, PROGOLFO and PROMANGLE receiving considerable support from USAID (PROARCA), the Nature Conservancy, the World Wildlife Fund and COHDEFOR. Instead, these sites and organizations may play a role as resource institutions assisting MESA with its own implementation. The description of the three selected areas follows.

a) Yerba Buena Mountain Bilogical Reserve – Declared by the 87-87 Decree, the Yerba Buena Mountain Biological Reserve is a priority water zone for south-central area of Honduras. Management responsibility was the given to an NGO called VITA de Honduras. It has done little to date in the way of protection for the area. Other institutions involved in protection and management activities are SANAA and AFE-COHDEFOR. The reserve is part of a large water producing area together with the Guacerique and Río Grande water Reserves used for water supply of the capital city and nearby municipalities. It is located in the Department of Francisco Morazán 7 linear km from Lepaterique. It belongs to the Forestry Region of Francisco Morazán. The reserve has approximately 3,510 ha (35.1 km^2). The buffer zone covers an area of 2,820 ha (28.2 km^2) and the nucleus has 600 ha (6.9 km^2). Yerba Buena is classified as cloud forest and supports a variety of ecotypes, wildlife and natural forests. It supports about 20 communities in the buffer zone, dedicated to annual crops and forestry exploitation.

b) Montserrat (or Yuscaran) Biological Reserve – The Monserrat Biological Reserve was created with the Decree 87-87 as an answer to the water demands of the municipalities of Yuscarán, Guinope and Oropolí. The first management initiative for the area was undertaken through an Agreement between the Municipal Development Network (REMIDES) and the Central Government (GOH) taking place in 1993. Unfortunately, changes of GOH administrations didn't allow solid management efforts to work towards the protection of the water producing reserve. Between 1996 and 2000 there were no protection efforts and the buffer zone was significantly altered. The reserve comprises an area of 22.4 km^2. Its nucleus is 1.5 km^2 and the buffer zone of comprises 20.9 km^2. It is located mainly in the municipality of Yuscarán. In 200, GTZ created the Yuscarán Foundation allocating some funds for the protection of the reserve. COHDEFOR, Fundacion Vida and PRONADEL are continuing limited assistance to the communities in management efforts. The Aurora sub-watershed flows through the reserve providing water mainly to 11 communities located inside the buffer zone in Yuscarán, Guinope and Oropolí.

c) Cerro Guanacaure - This water producing area was declared by the Executive Agreement No. 1118-92, with an extension of 323.2 km^2, is located 15 km southwest of the Choluteca City. It officially belongs to the Forestry Area of the Southern Zone. It contains two climatic zones differentiated by elevation – the Moist Tropical Forest covers 1,863 ha (57.64% total area), with elevations between 500-1000m meters and the Humid Tropical Forests has elevations from 100-500 meters. This reserve produces water for more than 19 communities, with approximately 100,000 inhabitants. This and other protected areas of the southern area are managed by CODDEFAGOLF, an environmental NGO sometimes assisted by DIGEPESCA/SAG. The recent local support from the *mancomunidad* (created by the neighboring municipalities) has made a marked impact in the protection of the reserve.

Sub-Watersheds of Importance

a) Río Guacerique – The Río Guacerique (236.4 km^2) currently presents high environmental degradation of forests and water resources given the numerous communities established in its drainage. Its source is in the Yerba Buena Reserve and it is the critical watershed feeding the *Las Laureles* Reservoir for the city of Tegucigalpa's water supply. Housing construction is a permanent threat within the watershed, provoking further removal of the remnant conifer or mixed forests typical of the area. Intensive agriculture on steep hillsides degrades the soil as does uncontrolled burning, inappropriate crops, invasive harvesting and poor techniques for soil conservation. Rain and other natural events wash out surface soils causing erosion and high rates of sedimentation that impact ultimately on the city water supply. Lack of sewage systems are causing deposition of crude municipal gray waters increasing water pollution with organic matter and pathogens that affect human health. Deforestation for agricultural land and fuel is accelerating damage. Industrial activities are also taking its toll on water quality. As the river crosses into Tegucigalpa, industrial activities such as the Pepsicola Company and other small industries deposit their crude effluents to the main stream.

b) Río Grande - The headwaters of the Rio Grande watershed (300.1 km^2) also lie within the Yerba Buena Biological Reserve, draining another water producing network of streams that have been declared a water producing basin zone for Tegucigalpa. It provides water directly to the *Concepción* Reservoir. The same environmental problems related to water management in the Guacerique subwatershed are common to this watershed. Industries like the Cervecería Hondureña and Mármoles de Honduras use high quantities of water for their production processes, and then return the effluents with high concentrations of chemical and solid pollutants to the river.

c) Yeguare River – This mid-basin tributary (HOW Many sq km???) has its headwaters in the Uyuca Biological Reserve above Zamarano. Its upper elevations are characterized by extensive standing, productive pine forests. The Pan America Agriculture School (Zamarano) has dedicated the last four decades to effective watershed management and water resources management in nine municipalities that are part of their influence area. Environmental problems are mainly derived from surrounding agricultural production, sewage disposal and forest fires. Zamarano has developed education programs in rural communities focusing on elementary grades in order to reach the core of future productive generations. Research has also been integrated to all management. This strategy is probably one of the best in the country and has been receiving national and international support to keep its programs sustainable. A key player for the protection of natural resources management in the zone is the Yeguare Mancomunidad (9 municipalities) surrounding the Zamorano Valley which own much of the regional forests.

d) Orocuina River – The mid-watershed presents the harshest bioclimatic conditions in the basin: very high temperatures year round and low humidity and only about 600mm of annual rainfall. The temporal distribution of this precipitation greatly affects crop harvests. Soils are generally shallow and unfertile. No protected area is identified in the area and only poor forest remnants are still standing. Water resources are extremely scarce and usually there are no local organizations involved in management. Fees of up Lps. 70.00/month ($4.5) are being paid for domestic water supplies. Rudimentary small scale technology has been implemented for landuse but none for environmental management. The watershed is the unique center of production of loofa (*paste*) which commands the entire national market and is in great demand. Municipalities are incipient, poor and lack technical assistance from personnel or local organizations. Very few projects are being implemented in the area.

e) Guanacuare and Rio Negro – The Guanacaure Water Producing Reserve produces water for Choluteca and for 19 neighboring communities, serving around 100,000 people. The area in managed by the Guanacaure Mancomunidad as owners of the resource and beneficiaries of the forest and water resource protection. The Regional Office of SANAA is also involved in the operation and maintainance of the water supply systems. The water quality of the rivers draining from the reserve is quite high but degrades rapidly

as agricultural and livestock activities increase on the surrounding land, contaminating the water with organic matter from domestic waste water and agrochemicals from sugar cane plantations. The Río Negro tributaries flow from the eastern side if the Guanacuare Reserve. They are another important source of water especially for the municipality of El Triunfo. Serious conflicts over water use are common with nearby municipalities. These do not receive benefit from the Guanacaure Water Reserve, nor are they part of that management effort.

f) Southern Choluteca River Valley – The municipalities of Choluteca and Marcovia are probably one of the most conflictive areas with respect to water use and management in the whole watershed. Intensive industrial agriculture of sugar cane uses arbitrarily high quantities of water for irrigation, sometimes retaining the total volume of running water in the river. Melon producers supply their plantations with well water, wells that are increasingly becoming dry in the past few years. Over perforation of groundwater wells for industrial uses and domestic uses has caused the aquifers along the Golf of Fonseca to suffer salt water intrusion, contaminating one of the few freshwater sources of all the population. Contamination caused by deposition of municipal and industrial wastewater is severe and is now causing important health problems such as those registered in Punta Ratón and Cedeño. Pollution caused by agricultural pesticides is serious in both the surface water and the aquifers. One of the most important consequences of all of this is the marked reduction of clean, fresh water reaching the estuaries. This has a devastating impact on the marine ecosystems, their biodiversity and the economically important shrimp industry.

Targeted Municipalities

There are 44 municipalities within the larger Choluteca and Rio Negro basin. The MESA project would be unlikely to achieve its operational effectiveness if spread uniformly across the entire basin. Based on the identification of the agro-ecological zones, the critical protected areas and the priority watersheds contributing to both rivers, the MESA program will concentrate its work in the 15 municipalities most closely linked to those critical areas and ones that are highly representative of the larger basin. These 15 cover 58% of the total area and 85% of the population (23% without counting the city of Tegucigalpa). These municipalities will support the full range of activities in the MESA program's four core components. They are listed here below.

Municipalities within the Choluteca and Rio Negro Watersheds

(data adjusted to reflect that part actually within the watershed)

(calculations based on 1993 Agricultural Census and 2001 population census)

Department/Municipality	**% in watershed**	**Area (Km2)**	**Population**	**Farms**	**Farm Area Ha.**
Francisco Morazán					
Distrito Central	100	1397	850445	2411	19320
Lepaterique	27	100	2683	298	1527
Maraita	100	237	5553	814	7278
Ojojona	16	38	1284	80	385
Choluteca					
Concepción de María	100	151	24393	2456	11182
Choluteca	100	1033	120682	2872	46283
El Triunfo	100	291	35629	3172	25058
Marcovia	100	466	37633	1419	31742
Namasigue	100	194	25029	2077	21385
Orocuina	100	120	15903	1367	5901
El Paraiso					
Guinope	100	193	6941	1001	5775
Liure	100	85	9675	792	3516
Moroceli	100	332	11971	1159	15068
Soledad	100	163	9558	970	4175
Yuscarán	100	336	11396	1056	12780
TOTALS					
15, including D.C.		**5,236**	**1,154,465**	**21,944**	**211,375**
Other 14 municipalities		**3,839**	**304.020**	**19,533**	**192.055**

C. Proposed MESA Activities

IR 1: Increased access to and application of technology for sustainable water use and management

Activity 1.1: Support the local management of legally declared protected areas.

Rationale:

The protection of land that is still in good condition is probably the most effective, low-cost means of assuring a healthy watershed. The working area includes several protected areas that cover watersheds critical to downstream users. Certainly one of the most important sources of water is the *Parque Nacional La Tigra* that supplies Tegucigalpa with 25% of its water. However, because of its importance, it is already receiving considerable support through AMITIGRA and probabilities are high that powerful interests in the capital will cause additional resources to be channeled toward La Tigra. Therefore, the MESA Project will not work there directly.

The new *Mancomunidad Area Protegida Productora de Agua Guanacaure* of approximately 2500 ha, a few kilometers northwest of Choluteca, supplies water to that urban area and to several nearby municipal centers and communities. Legal responsibility for management of this area rests with the *Mancomunidad Guanacaure*, a loose association of nine surrounding municipalities, only four of which have a significant stake in the water from this protected area. SANAA helps several of the rural communities with their water supply (Agua Fría, La Tajeada, Las Lomas, La Laguna, El Aguaje) but expects to reduce its responsibilities in this region. There might be value in helping the *Mancomunidad* with the management of the watersheds supplying those systems (Choluteca, Namasigue, El Triunfo, Concepción de María). The Cooperación Española will assist the municipalities of Corpus and Yusguare. Support for this new protected area is incipient but could accomplish the double purpose of not only assuring conservation but also of acting as a nucleus around which collaboration among these municipalities and communities could crystallize. For most of the downstream users of the water from Guanacaure problems of supply and quality, especially during the long dry season, are limiting their agricultural and economic development, are detrimental to their health and are increasingly the sources of conflict.

The second protected area on which the project could focus is the Montaña Montserrat of 2240 ha that supplies water to the municipalities of Yuscarán, Guinope and Oropolí. Since two years ago, COHDEFOR/GTZ *"Proyecto Apoyo a la Forestería Comunal"* (AFOCO) has implemented a project in the lower parts of Yuscarán having as a main objective the management and protection of the conifer forests by community organizations. The Yuscarán Foundation which grew out of this project is implementing a forest management plan, approved by COHDEFOR, and is allocating some funds for the protected area. Activities have emphasized protection and restoration of natural resources, environmental education and health. Financing of the COHDEFOR/GTZ Project is uncertain after April 2002, putting the protected area at greater risk. The MESA Project will work through the Yuscarán Foundation to help carry out the management plan, following the process outlined in Activity 1.2.

The third protected area of focus will be that part of the 10,358 ha Montaña Hierba Buena Biological Reserve that lies within the Río Guacerique and Concepción watersheds. SANAA is carrying out some basic management activities in these two watersheds and would receive support from the project to reorient and intensify some of this work.

Techniques for management of similar protected areas are known and tested within Honduras and elsewhere, often through USAID funding. One strategy that will be used is to motivate and organize the downstream beneficiaries to take responsibility for the upstream protected area. *Fundación Vida* could provide part of the operating cost after end of the MESA Project.

Projected MESA Result(s): 3 protected areas (Guancaure, Hierba Buena and Monserrat, 7,750 Ha.) managed by a functional, independent entity in collaboration with local and national authorities (La Tigra model)

Tasks:

1. Create and train a unit responsible for management of the Guanacaure Protected Area, whose members are drawn from the UMAs of the beneficiary municipalities, especially from Choluteca.
2. Inform, consult and educate the population affected by the three protected areas as to benefits, responsibilities and rules.
3. Based on the above consultations, and existing plans and information, carry out demarcation of the protected areas along critical parts of the boundaries.
4. Create, train and deploy a cadre of guards.
5. Organize communities that use water from the protected areas to prevent and control fires, and to stop land invasions.
6. Propose a financial mechanism to share the management cost between beneficiaries in the municipalities (related to payment for environmental services).
7. Use persuasion, coercion and economic incentives to gradually get inhabitants of the protected area to improve their land use.
8. Assist local communities in applying for matching grants for structures and activities related to water from these protected areas, so as to provide a further incentive for their protection.

Geographic focus: Choluteca basin: Watersheds within and near the Guanacaure Protected Area, Montaña Montserrat, Montaña Yerba Buena Biological Reserve.

Lead implementer: Local NGO with experience in national park management (AMITIGRA, EAP-Zamorano or Fundación Vida)

Collaborators: Mancomunidad Guanacaure (9 municipalities) and individual municipalities, Yuscarán Foundation, SANAA, COHDEFOR, contracted Honduran technical assistance firms

Activity 1.2: Support the management of natural forests.

Rationale:

Natural pine, hardwood and mixed forests cover more than a large proportion of the project watersheds. Many continue to be degraded by uncontrolled logging, grazing, fire, clearing for agriculture and cutting of fuelwood. A large fraction of these forests could be managed for sustainable production, especially those with a high proportion of pine. Because the remaining forests tend to cover the higher areas and steeper slopes, they are especially important in decreasing surface runoff and erosion. The application of proper management practices would not only contribute to the health of the watershed but also provide income to forest owners, municipalities and local inhabitants. During more than 25 years, Honduras has experienced numerous practices, approaches and projects aimed at managing the forest, many of them quite successful. In spite of its ups and downs over the years and its gradual metamorphosis, COHDEFOR's Social Forestry System, through numerous foreign donor projects, has learned and documented important lessons (see references consulted). It has become evident that success is more likely when the local stakeholders participate in planning and draw benefit from management, as was also confirmed by USAID's UWR Project, especially through the work done by Zamorano.

Within those sub-watersheds selected as priority by the MESA project because of the interest to downstream users, the project will identify those forests belonging to municipalities (*ejidal*), the national government or motivated private owners. The project could assist municipal and community groups, as well as private owners, in managing these forests for water, timber, resin, fuelwood, and other products in accordance with management plans. The inclusion of national forest will require negotiating long-term agreements between COHDEFOR and the groups in charge of management. COHDEFOR has a precedent and standard procedure for drawing up such long-term agreements for what are essentially community forest concessions The municipal and community groups will need strengthening in organizational, business management and technical aspects. A particularly promising case are the combined forests owned by the municipalities of Yuscarán, Guinope, San Antonio and Maraita, belonging to the *Mancomunidad Yeguare* surrounding Zamorano for which the *Mancomunidad* could take over responsibility for management as a single management unit by the end of the project. Part of the net income would flow to the municipalities, motivating their support.

Other priority watersheds that still contain significant areas of forest with production potential are the upper reaches of the drainages that feed the Los Laureles and the Concepción reservoirs. There is a long history of organizing communities to manage these forests, especially for resin production (resin tapping by communities has proven to be the most effective means of preventing forest fires). Unfortunately an excessively strict, well-intentioned interpretation of the Environmental Law by the *Fiscalía Ambiental* that prohibits any kind of utilization of the forest has made it extremely difficult to do proper forest management in these two watersheds. Paradoxically, as is common in such cases, this prohibition against local inhabitants deriving a benefit from the forest is leading to its destruction through clandestine harvesting and fire. This is an area appropriate for trying to reorient attitudes of decision makers.

Projected MESA Result(s): 6000 Ha. of natural forest in 6 municipalities managed through active engagement of community organizations, local enterprise and producer associations

Tasks:

1. Use overlays of forest cover, the boundaries of priority watersheds, forest tenure and the location of the formally registered agroforestry organizations, combined with other information already available in COHDEFOR and SANAA, to select the *ejidal* and national forests, and the communities with potential for sustainable production.
2. Identify and motivate legally organized groups and private owners to manage these selected forests and negotiate agreements with COHDEFOR.
3. Educate stakeholders, environmental groups and relevant decision makers as to the watershed value of proper forest management and harvest.
4. Assist these local management groups in preparing management plans using the MAFOR model and obtaining their approval.
5. Train and advise the management groups in organizational, business and technical matters.
6. Assist management groups in locating buyers, negotiating contracts, obtaining initial operating capital through advance payments or other means.
7. Assist management groups with management and harvesting operations as needed, gradually emphasizing payment for this assistance as management generates increasing income.
8. As the groups mature, assists the more promising ones in purchasing small sawmills or other appropriate processing equipment, including for secondary processing.
9. Support fire prevention and control groups in the forests managed through the above scheme, as well as other groups existing in the Yeguare, Los Laureles and Concepción watersheds, and create new groups in those watersheds.

Geographic focus: Upper and upper-middle watersheds of the Choluteca basin. Within that large area the forests to be managed will be those in the priority sub-watersheds supplying the municipalities of Yuscarán, Guinope and Maraita

and those municipalities that affect the Los Laureles and Concepción watersheds: Ojojona, Lepaterique and Distrito Central.

Lead implementer: Local NGO with experience in forest management with community group focus (EAP-Zamorano and Fundación Vida)

Collaborators: Selected municipalities that own forests, legally organized community groups (Fundación Yuscarán, *patronatos, juntas de agua*, forest cooperatives), private owners, COHDEFOR, SANAA, contracted Honduran technical assistance firms.

Activity 1.3: Improved Irrigation Efficiency:

Rationale:

In the Headwaters, and especially in the Guacerique sub watershed, vegetable crops are cultivated for sale in the nearby capital. Large amounts of agrochemicals and liberal amounts of poultry manure are applied to crops. In the 7 month dry season (November – May) stream water is used to irrigate the crops which in turn reduces the flow of water into the Laureles reservoir during the critical dry season as well as causing organic and chemical contamination. Ideally the whole upper watershed area should be converted into a forest reserve and the vegetables would be grown and trucked in from other areas such as Siguatepeque and Marcala. Unfortunately this solution would require considerable political will. A cheaper and more politically acceptable solution would be to work with the farmers to convert their sprinkler irrigation systems into drip irrigation. This would halve the consumption of water for irrigation purposes in this area.

Conflict already exists between the different water users in the lower watershed area – melon growers, cattle ranchers, sugar cane growers and urban water systems. Melon growers use drip irrigation. Cane growers use less efficient surface irrigation and construct temporary dams for this purpose – stopping the flow entirely. Their expressed hope is that the San Fernando dam will soon be built, which would enable them to irrigate 5000 hectares. Some of them are also aware of the greater productivity potential of drip irrigation and have demonstrated that it is economically viable if the system lasts 7 years before replacement is necessary.

Surface and sprinkler irrigation is also used in the Orocuina sub-watershed (principally for fruit trees and loofahs) and also in the Moroceli area. In both these cases greater efficiency would lead to an increase in the area under irrigation.

Irrigation is a government priority and funds for this activity would be available from PRONADERS. Unfortunately this institution has a very limited promotional capacity and very little use has been made of the available funds. The opportunity exists for the MESA project to bring together the potential users and the potential financers of drip irrigation systems. MESA could help create or improve a very limited number of irrigation demonstration sites, which would then be utilized in the promotion of this technology.

Projected MESA Result(s): 4 drip irrigation demonstration units established in the Orocuina, Marcovia, Lepaterique and Moroceli in cooperation with local enterprise

Tasks:

1. Identify different irrigation systems being used in the upper and lower watersheds.
2. Locate and help create a very limited number of drip and water harvest demonstration sites.
3. Bring together the stakeholders in this activity (distributors of drip irrigation systems, heavy machinery contractors, financial institution representatives and users) to observe the efficiency and economy of irrigation use, using different water tariffs.
4. Assist stakeholders in planning activity expansion.
5. Monitor the process and results.

Geographic Focus: Lepaterique, Marcovia, Orocuina and Moroceli

Lead Implementer: Local NGO or institution specializing in irrigation systems.

Collaborators: Producer groups, municipalities, SERNA, PRONADERS, suppliers of drip irrigation equipment

Activity 1.4: Foster the diversification of commercial, perennial crops

Rationale:

The traditional subsistence cultivation of basic grains and extensive grazing not only give a very small return on investment, but also cause enormous runoff and soil erosion. The expansion of the urban market creates the opportunity for substituting a portion of the basic grain area with fruit trees, which are much more environmentally friendly. The urban migration of youth is the second reason for the potential of this type of activity. Many first generation urban dwellers have inherited tracts of rural land and would prefer to plant them with crops that do not demand their constant attention. Fruit trees would be a perfect solution for this situation. So would shade-grown coffee, and although this environmentally friendly perennial cash crop is in crisis at the moment, there might be scope for producing for some specialty coffee markets.

This type of activity has greater potential in the upper and mid watersheds, especially various kinds of grafted fruit trees (e.g. avocado, mango, citrus, etc.). Under the UWR and other projects, Zamorano has had success with creating small nursery businesses, linked with on-the-job training.

At the same time, the FINTRAC Non-Traditional Agricultural Exports Project is already promoting NTAE by providing technical assistance and business development services to producers and microprocessors of high-value crops. FINTRAC's demand-driven approach to develop the non-traditional sector focuses on market intelligence to provide value added throughout the marketing chain. Among the perennials, FINTRAC focuses on specialty coffee and cashew nut. Cashew has a long history on the Pacific slope of Central America. The first stage of the cashew tree project that was implemented in Choluteca and Valle in 1972 – 1974. The promised processing plant never materialized and many plantations were abandoned. Eventually local entrepreneurs began small scale processing operations, sometimes supported by NGOs ('People-To-People' and others) with the result that there is a new interest in planting this drought resistant tree. Tamarind might also merit consideration for the dry areas.

Projected MESA Result(s): 500 farms have each increased fruit tree area by an average of 0.25 hectares.

Tasks:

1. Select specific perennial crops that have a good local market and/or export potential, and that are suitable for the priority watersheds.
2. Identify possible marketing channels and establish contacts between potential producers, processors and buyers.
3. Assist community groups in the priority watersheds in establishing nursery businesses for grafted fruit trees.
4. Provide selected community groups with processing equipment, including ecological coffee processing equipment, using the matching grant mechanism.
5. Improve product presentation, labeling, develop trademarks and assist in legalization.
6. Provide technical assistance in establishment and management of the fruit trees produced in the nurseries.

Geographic Focus: Municipalities of Lepaterique, Distrito Central, Guinope, Yuscarán, Moroceli, Maraita, Namasigue, El Triunfo, Concepción de María, Orocuina, Liure and Soledad

Lead implementer: NGO that has experience in agricultural business and marketing (prime candidate EAP-Zamorano)

Collaborators: Community groups, FINTRAC, FHIA

Activity 1.5: Promote validated small-scale technology related to water resource management in rural areas

Rationale:

Recent experiences show that the identification and implementation of well conceived water projects providing concrete solutions to immediate community needs offer additional opportunities for water administration by communities. Proven practices such as small-scale water systems, stream corridor restoration, catchment structures for rainwater conservation, and a few of the many soil conservation practices attempted in the past can substantially improve water management. However, great care must be taken to learn from the many attempts at soil conservation in the past that never spread beyond the farm where they were introduced. Numerous demonstration sites of the best technologies exist throughout the watershed area – the result of years of work of extension programs. The most important lessons in the past have been the following: only promote technologies that will not require subsidies for their adoption by the majority of rural families, validate the technologies locally, limit the number of technologies to promote to a minimum, field technicians must live in the rural areas, use well selected and trained local men and women as contact farmers, constantly supervise field activities and implement a functional monitoring system. It is important to note that some institutions have adsorbed these lessons and have increased their capability to promote selected technologies. Improving community access to clean drinking water and water for irrigation underlie this activity and must be the incentive to manage the watersheds above the structures.

Projected MESA Result(s): 3000 farms use of an average of 3 validated technologies (including rock wall barriers, stream protection structures, vetiver live barriers, fuel efficient stoves and water storage for human, cattle and irrigation use.

Tasks:

- In the priority watersheds, identify sites and communities that show potential for applying small-scale water technologies.
- Carry out a rapid survey of the existence and state of utilization of potential technologies in watershed area.
- Design structures based on the communities expressed needs.
- Apply for financing using the matching grant mechanism.
- Construct the structure with participation of the communities.
- Validate and demonstrate additional soil conservation practices (e.g. fuel efficient stoves).
- Select and train local technical leaders in conceptual and practical aspects (female and male)
- Organize experience interchange events between different participant groups.

Geographic Focus: Municipalities of Lepaterique, Distrito Central, Guinope, Yuscarán, Moroceli, Maraita, Namasigue, El Triunfo, Concepción de María, Orocuina, Liure and Soledad

Lead implementer: NGO that has experience in micro-watershed planning and in rural communication (Prime candidates: EAP-Zamorano in Zamorano area and VIDA – local NGO in southern area)

Collaborators: Community groups, local NGOs, municipalities.

IR 2: Strengthened local capacity for water resources management

Activity 2.1: Improve the management and use of water resources data in Honduras.

Rationale:

There is an urgent need to supply relevant and verifiable hydrologic data to help resolve Honduras' development problems. These include flood early warning, the design and construction of civil work (roads, bridges, water supply) and for the allocation of water to competing economic development interests – agriculture, industry and urbanization. Currently, hydrologic and meteorological data are being generated and housed in multiple institutions. Because government agencies have very limited operational funds and change personnel frequently, they have not been enlightened managers of the information that is collected. Access to designers is not convenient, use of the data is limited, there are no formal quality control measures in place for data management and its application to pressing development problems is almost non-existent. There are competing interests among the agencies. Recent investments in the remote hydro-meterological monitoring (hydromet) network and data management systems by the USGS are not being adequately maintained or operated by the host institutions.

Projected MESA Result(s): A functioning hyrdo-meteterological monitoring network maintained in the Choluteca basin with reliable data being distributed to legitimate users and clients

Tasks:

The MESA project will provide TA and financial resources to: a) consolidate a coordinated operation and maintenance system; b) develop a data processing, archiving, distribution and publication capacity for the increasing volume of data. The MESA team will work closely with USAID and the USGS advisory team in the planning and implementation of this activity. The full quality-assured data set will be forwarded to the SERNA (RRHH) on a regular basis as the national repository of all water resources information.

1) Identify an implementing partner and conclude a formal agreement for the operation and maintenance of the identified portion of the hydromet network covering the elements of O&M protocols, system integration, technical standards, cost sharing, .

2) In collaboration with the USGS, provide relevant training to the partner in system O&M, data verification, database management, data sharing protocols and in the general science of water quality and water quantity monitoring.

3) Using the MESA project Choluteca basin work as a case study and the first priority, work with the implementing partner to make accessible hydrologic data to basin constituents, industries, users and public officials involved in water resources planning and to instruct them in the best uses of these data.

4) Building upon the model thus far developed, expand data collection where practical to other agencies and other kinds of data (beyond the hydromet series) such as groundwater, water quality, etc. develop a functioning water resources data center for the Choluteca basin.

Geographic Focus: The MESA project will focus on the operation and management of the USGS hydromet network in the Choluteca basin and in those other areas not covered by separately negotiated operating agreements under the USGS five-year network management plan. The intent is to cover the USGS/NOAA network in the Choluteca Basin.

Lead implementer: Institution with the technical capacity and relative stability of qualified personnel (Prime candidate: EAP-Zamorano)

Collaborators: SERNA, Zamarano, Municipalities.

Activity 2.2: Develop the local capacity for the management of water resources and watersheds.

Rationale:

Most project activities with local participants will help develop and improve capacity for integrated water management. This particular activity underlies the others and integrates many interventions around water resources. Many of the responsibilities for water management formerly borne by the central government, many of them through SANAA, are now being passed to the municipalities and communities, even though most of these do not have the capacity to fulfill them. There is an urgent need to develop the organizational, management and technical capacity of these local governments with respect to many of their functions but especially with respect to water, which integrates a lot of their other concerns and visibly impacts the inhabitants.

The Environmental Management Units (UMA) established by law in numerous municipalities are a step in the right direction and a nucleus around which various water related activities could crystallize. Municipalities like San Pedro Sula and Puerto Cortés illustrate the potential of the UMAs to set and enforce guidelines and carry out management of watersheds, but most others fall short of being able to fulfill the environmental mandates of the municipalities. The recent experience of numerous initiatives, including USAID's Forestry Development Project and Zamorano's work in the UWR Project, have demonstrated that some of the municipalities and local water users groups respond well to outside support for water resources management.

A few of the municipalities in the Choluteca basin have benefited from USAID's efforts at municipal strengthening through which they received geographic information systems and other support. One of the challenges will be to create a cadre of qualified technicians in the UMA's and other units of the municipalities, equip them with the tools and budget they need so as to make them so politically and financially useful to the municipal administration that they can survive the changes wrought by party politics. On a more local level, the Juntas Administativas de Agua function democratically, but have little capacity to access to funds, technology or to integrate into any larger scheme. And on a higher level, some 'mancomunidades' have been formed, but their current immediate purpose has not included watershed planning.

Projected MESA Result(s): 2 *Mancomunidades*, 10 municipalities and 20 Juntas *Administativas de Agua* implementing locally formulated and supported management or development plans

Tasks:

1. Strengthen the UMAs of selected local governments, local water boards, and other groups organized around water by helping them to set realistic goals and equipping them with the appropriate working tools, all through a matching grant mechanism that requires contributions from the municipalities.

2. Provide on-the-job training to the UMAs, local water users groups and others in water resource management, targeted to their specific needs and linked with other opportunities for learning within the MESA Project.
3. Educate mayors, *consejales municipales* and community leaders with respect to water resource issues, and analyze options with them in order to develop practical action plans.
4. Assist municipalities in making better use of the formal declaration by COHDEFOR of a watershed as being protected, a designation that gives more clout to municipal interventions and enforcement, a potential that is currently seldom realized.
5. Promote agreements between municipalities for the horizontal transfer of experience, especially with respect to regulations and their enforcement, mechanisms for charging fees, preparation of proposals for assistance and other relevant subjects.
6. Use these agreements, the *mancomunidades,* and other associative forms as channels for training events and technical assistance.

Geographic Focus: Upper watershed (Los Laureles and Concepción Reservoirs): Municipalities of Lepaterique, Ojojona, Distrito Central. Upper middle watershed (RíoYeguare): Municipalities of Morocelí, Yuscarán, Guinope, Maraita. Middle watershed (Río Orocuina): Municipalities of Soledad, Orocuina, Liure. Lower watershed (Río Choluteca): Municipalities of Choluteca, Marcovia. Río Negro watershed (Guanacaure): Municipalities of Namasigüe, El Triunfo, Concepción de María, Choluteca.

Lead implementer: NGO with experience with working with municipalities and UMAs (prime candidates: EAP-Zamorano and Fundación Vida)

Collaborators: Associations of municipalities (i.e. Mancomunidad Yeguare, Mancomunidad Guanacaure), SANAA for the Lepateríque, Ojojona and Distrito Central, *juntas de agua, patronatos*, proyectos de desarrollo rural y ambientales, SERNA.

Activity 2.3: Develop the local capacity to operate and maintain critical water and sanitation systems.

Rationale:

Existing critical water and sanitations systems are failing at an alarming rate. Poor design has led to system dysfunctions. Pumps, control systems and civil works need continuous monitoring and maintenance. Donors are reluctant to fund new works without resolving the operation and maintenance dilemma. Failed water supply and treatment systems lose there intended effects in addressing watershed and water resources issues. They are also a significant risk to human health. Solving this issue requires economies of scale to be successful as each municipality or community system simply cannot mount its own facilities for O&M. Two institutions within the Choluteca basin - SANAA (Choluteca region) and Aguas de Choluteca - have an incipient capacity and high potential to help resolve this problem and to service other areas (rural and urban) as well.

Projected MESA Result(s): 1 municipal O & M system in operation (Aguas de Choluteca), providing service to 4 major water systems and 1 regional O & M system in operation (SANAA), providing service to 25 rural water systems.

Tasks: The MESA project will develop within these institutions the capacity to insure operation and maintenance of critical water and sanitation systems

1) Provide technical assistance and financial support to SANAA's regional office to retain and operate and expanded repair and maintenance facility for the rural potable water systems in the Choluteca basin.

2) Provide technical assistance and financial support to Agua de Choluteca's maintenance operations so that it can conclude and implement maintenance support agreements with other urban or peri-urban water supply authorities in the southern Choluteca basin.

3) Help set up financial mechanisms for these two institutions, and for their service users (other water service providers) so that their customers pay for the requisite O&M services

Geographic Focus: This activity focuses uniquely on the Municipalities of Choluteca, Morolica, Marcovia, Apacilagua, and Orocuina ….

Lead Implementer: 'Aguas de Choluteca' and SANAA. Technical assistance can come additionally form the National Autonomous University, CHN and the Honduran College of Civil Engineers and others.

Collaborators: SANAA (National), Associations of municipalities, municipalities

IR 3 Improved environmental education and awareness of water resources management

Activity 3.1: Improve Environmental Education in Schools

Rationale:

Environmental education in schools contributes significant benefits towards creating public awareness about water issues. In the first place, everyone agrees that working with youth is the key to changing attitudes in the future, and that environmental education should be part of the curriculum. Another big advantage is that school teachers are effective leaders in the rural areas and their participation in environmental education makes them become more aware of the issues and more willing to support environmental initiatives. A further advantage is that some institutions have already accumulated experience in this activity and have developed text books and teacher guides.

Successful environmental education programs in Honduras have considered certain situations, such as limited school attendance (an average of 3 years schooling per rural school leaver). The parents' principal objective is that their children learn how to read and write and basic arithmetic, and consequently environmental education must be introduced as an interesting and practical transversal topic, which enhances the study of the principal subjects. Another important consideration is to train and support the primary school teachers, in view of their limited experience in conducting inductive learning processes, which is necessary for the students to comprehend the complex environmental situation.

A further consideration is the need to monitor more completely the impact on environmental awareness or on the students' knowledge and skills as a whole (mathematics skills, descriptive skills, etc.,). Some work has been done in this aspect by Fundación Vida and EAP Zamorano, but more information is necessary in order to convince the national education authorities. It is important to note that at least 20 different institutions have been active in environmental education in Honduras, but no common scheme has yet evolved.

Projected MESA Result(s): 2000 primary school and distance students participating in structured environmental education system, 1 environmental education comparative study conducted with/among 12 education institutions.

Tasks:

1. Select participating schools in areas where watershed management plans are being carried out.
2. Print teacher guides and other support materials.
3. Train local teachers.
4. Prepare individualized chronological study plan, including visits of observation and participation in watershed management activities.
5. Monitor of program activities.
6. Interchange meeting with collaborating institution personnel, teachers and education authorities.

Geographic Focus: on a very limited scale in areas where practical watershed or microwatershed management plans are being carried out.

Lead implementer: NGO (or project) with experience with in environmental education (prime candidates: EDUCATODOS, EAP-Zamorano and Fundación Vida)

Collaborators:

Activity 3.2: Use mass media and advocacy to change attitudes and behavior concerning water resources

Rationale:

The use of mass media (especially radio and newspapers) has demonstrated their potential to create awareness about environmental issues and to publicize the actions being carried out by different projects and institutions in this field. Properly used, the message can reach many people. The general public begin to dispel their naturally negative bias against 'development projects'. People are informed about the existence and use of different solutions to the environmental problems and the costs involved. The self-esteem of the different actors can be increased which stimulates them to maintain or expand their commitment. It can also foster the public's will to demand accountability for projects of the same type.

A few development programs have made very successful and economic use of mass media, despite its inherent cost and complexity. They have created quality messages that compete for the fickle public's attention (it is so easy to change channels or to skip newspaper pages). Another important consideration is to try to bridge the gap between 'information' and 'action', since real environmental awareness can only be created by doing things. Within this context, awards and prizes may be given, to increase the audience and to stimulate them into action.

Projected MESA Result(s): 18 newspaper articles published in national press in 3 years, 2 once-weekly environmental radio programs (or sections) transmitted during 2 years.

Tasks:

1. Carry out a quick survey of established radio and television programs and determine their receptiveness to broadcast environmental news.
2. Create, locate and distribute audience-oriented material for selected programs. This material should concentrate on the human focus – 'Mrs. Sanchez from Porra Grande now can bathe 3 times a month, thanks to the work carried out by the her and her neighbors in the upper watershed of the Río Seco'. Material should concentrate on interviews with local participants and avoid the temptation to boost the image of project-related dignitaries. A special effort should be made to give equal billing to women and men participants.

3. Locate, create and distribute general interest illustrated tips on how to save money on water bills by using a specific water saving technology. For example 'your leaky cistern costs you Lps.600 per year. To save this money …..' This type of activity could even be sponsored by hardware stores.
4. Local awareness raising actions would include large photo displays that could be set up in front of the municipal offices where watershed management plans are being implemented. Another action would be local environmental award giving ceremonies.
5. Monitoring of audience levels.

Geographic Focus: on a very limited scale in areas where practical in the project area, in the national periodicals

Lead implementer: NGO or consultant with experience with working with mass media.

Collaborators: Participating institutions and community organizations in MESA activities and sponsors.

Activity 3.3: Support information interchange via a network of actors involved in water resource management.

Rationale:

In the past 10 years over 40 projects dealing with watersheds are or have been active in Honduras. Many lament that contact between them is minimal and most do not know which others are doing or have done similar work. Because their work is usually divided geographically rather than functionally among projects, the map of Honduras is a mosaic of discrete territories supposedly "managed" by the diverse projects, NGOs, GOH agencies, municipalities, etc. They would have a lot to learn from each other and could all benefit from better coordination and division of labor. By law, (Ley de Ambiente, Article 100) the Departamento de Cuencas in SERNA has been designated to create and support a national network of actors involved in watershed management. However, given the drawbacks of this institution, others might be more appropriate for initiating this network and could perhaps be delegated to do so by SERNA. The *Grupo Colaborativo de Agua y Saneamiento* already operates a similar network related to water supply and sewage disposal, which could possibly be expanded to include watershed management.

The project will assist the selected institution to establish a network of actors involved in watershed management throughout Honduras. Communication will be primarily by electronic means via email, web page and the distribution of CDs. This is a simple, low cost means of communication among all actors, as well as a means for the MESA project to disseminate its experience. Better communication is likely to stimulate better collaboration and coordination from the bottom up.

Another way to stimulate information interchange between institutions is through periodic symposiums. These can be directly linked to the web page, to produce a more active and continual dialogue.

MESA Goal: 1 Web page established and functioning and 1 symposium per year (total 3)

Tasks:

1. Equip the selected institution with the basic computing equipment, software, internet access and operator.
2. Maintain and update the existing database of watershed projects, including their email addresses.
3. Via email, invite relevant actors to join the network and explain advantages and responsibilities.
4. Via email attachments, distribute selected documents, announcements and other information throughout the network and invite reciprocation.
5. Establish a web page for which members of the network can submit information of interest to others.

Geographic Focus: All of Honduras.

Lead implementer: Government or Non Government institution with inherent leadership and technical capacity. Prime candidates are: Departamento de Cuencas at SERNA, Zamorano, *Grupo Colaborativo de Agua y Saneamiento, Comisión Nacional de Manejo Integrado de Cuencas de Honduras (CONAMICH).*

Collaborators: Members of the network.

IR 4 Improved legal and policy framework for water resources management

Activity 4.1: Promote the creation of mechanisms to *[plan for regional water resources development and avoid or]* resolve water conflicts

Rationale: Water is one of the most limiting resource**s** to Honduras' continued economic development. Urbanization, commercial agriculture and industry are all competing for access to clean and reliable quantities of water. The existing hydrologic resource is incompletely mapped and little understood. The full extent, range and location of users are not even estimated. This is especially significant in the Choluteca region. The dry region uses every drop of water it can draw for multiple high-value production systems and increasing domestic use. With the risk of conflict over access to water so high, there is an urgent need to establish and demonstrate the potential value of mechanisms to plan for regional water use and avoid or resolve water conflicts.

Strengthened participatory planning processes are urgently required. The use of alternative dispute resolution mechanisms, especially those related to water resources management, is gaining currency, and proving successful, in many localities. The *Dirección General de Ordenamiento Territorial* in the *Ministerio de Gobernación*, through different foreign-financed projects has been preparing guidelines and zoning maps for some municipalities. Application of this proposed zoning could create numerous conflicts that will need resolution. USAID's past work in Honduras in natural resources management gives it the standing to get involved in this complex arena.

Projected MESA Result(s): 1 regional Water Forum established (Chluteca, Marcovia, El Triunfo and Namasigue) for planning, development and administration of water resources

Task: The MESA Project will focus on the immediate pressing demands of water allocation in the southern Rio Choluteca basin. It will lead a participatory process aimed at identifying legitimate stakeholders, understanding their historical and anticipated uses of the region's water, and securing a consensus-driven response or plan of action to rationally, **and equitably,** develop and allocate the water resource.

1) Identify the legitimate stakeholders and construct an open forum for building knowledge of the region's water resources.

2) Use the established forum to launch a collective education effort on the availability, demands and environmental imperatives of water resources development in the region.

4) As required, use MESA technical assistance and funds to acquire critical hydrologic data, current water use information and potential future development alternatives.

3) Lead the forum through a series of open debates and discussions (*cabildos abiertos*) on the elements to be included in a regional water resource plan.

4) With the forum, complete a regional water resources action plan – current allocations and use, further studies to be completed, alternative dispute mechanism, priority water resource development plans, priority economic plans to be supported.

Geographic Focus: This activity will be focused uniquely in the municipalities of Choluteca, Marcovia, Namasigue and El Triunfo.

Lead Implementer: Consultant or local institution with the required technical and organizational capacity.

Collaborators: Municipalities, SERNA

Activity 4.2: A financial mechanism established to facilitate construction of new works in water and sanitation

Rationale:

There is a huge unmet demand for new water supply and water treatment systems. Perfectly legitimate construction projects are within the technical and organizational reach of some municipalities. However they lack access to financing. Water works, such as those in San Pedro Sula, Puerto Cortes and other municipalities, have shown themselves to be profitable and thus can qualify for private sector financing.

Projected MESA Result(s): Financial mechanism established

Tasks: The project will promote a new facility for works construction using the Honduran private financial sector and USAID's Development Credit Authority guarantee mechanism to open a financing "window" favorable to the basin's municipalities. Another option is to increase or redirect some of the funding of USAID's reconstruction project (No. 522-0410) that is destined for water-related infrastructure in other parts of Honduras, toward the MESA Project priority watersheds. (The only infrastructure done or planned so far by that project in the Choluteca basin is in Limon de la Cerca and in urban Choluteca.)

1) Negotiate a credit guarantee under the DCA with an appropriate Honduran financial institution.

2) Undertake a campaign to educate a targeted set of likely qualifying municipalities and water authorities on the suitability of the facility for their future public works and how they apply for credit.

Geographic Focus: All of the municipalities (or autoridades de agua) within the Choluteca basin that can qualify for the financing package.

With Whom: The MESA Project (institutional contractor) will work directly with the DCA, private banks, USAID and the municipalities.

Activity 4.3: Assess the financial feasibility at the municipal level for compliance with the full package of local water law.

Rationale:

Much of the legislation and regulations related to water resources set unrealistically high standards for the municipalities but do not give them the means to meet those standards; with the result that many of the municipal authorities could be taken to court for non-compliance with the law. This situation also exacerbates the pervading attitude of impunity with respect to law. Knowing what the cost would be to meet

the legal standards would result in more realistic laws and regulations. At the same time it would drive municipal efforts at meeting standards in more realistic directions, with higher payoffs. The project will contract a one-time evaluation of the full cost and technical implications of the existing and pending water resources legislation, including a plan of how to gradually move from the current situation to the desirable one that is financially feasible. The plan needs to include the strategy by which the municipalities can control industrial effluents and how they can obtain the financing needed to do so. The evaluation would help set realistic expectations for the GOH and municipalities.

Projected MESA Result(s): 1 Study completed and distributed to water resource related institutions and donors

Tasks:

1. Draw up the terms of reference, carry out the bidding process and contract the study, covering the municipalities that would most likely apply the results (probably larger municipalities).
2. Carry out the evaluation and oversee progress.
3. Discuss results with and obtain feedback from the municipalities involved, from the institutions that prepare legislation, Congress and other stakeholders.
4. Disseminate the final results widely among the stakeholders.

Geographic focus: Selected municipalities within the watershed area

Lead Implementer: Consultant or local institution with the required technical and organizational capacity

Collaborators: The selected municipalities, SANAA, SERNA, *Secretaría de Salud*, AHMON

Activity 4.4. Develop guidelines and/or regulations for water resource management at the municipal level

Rationale:

The deficient knowledge of the municipal governments about legislation and the extent of their own authority results in bad use and distribution of water resources and neglect of the watersheds. These local governments are the ones who should resolve conflicts in water use using the legal means at their disposal so as to create the regulations and controls that rapidly and efficiently order distribution, quality and sustainability of the resource. Some municipalities have made good progress in this direction. San Pedro Sula has developed environmental guidelines based on the environmental law and the law governing municipalities and is enforcing them in the watersheds and elsewhere with respect to zoning, permitted land uses, new construction, new wells and other activities with environmental impacts. This municipality has obtained an executive decree strengthening its authority in the watersheds that supply the city. No municipality in the MESA project area has adequate guidelines and regulations governing water and the environment but all would benefit from developing them.

Once regulations and good practices have been developed, a common limitation to their application is financial. Requiring the beneficiaries of environmental services to pay has often been proposed, but runs into the complicated problems of fixing the amounts, setting up a fee mechanism, convincing the beneficiaries and actually using the funds effectively for the intended purpose. The problem is relatively simple when dealing with some forms of water use. The most feasible starting point is charging domestic users of water for the cost of maintaining the health of the watershed. At present these users only pay for the cost of distribution and treatment. The law prohibits municipalities from taxing for this purpose but does allow them to increase their fees and designate a portion for managing the watersheds. However, initiating such increases in fees requires educating not only the public involved in order to avoid political opposition,

but also the municipal authorities. A few municipalities are making progress in this direction, especially the Division Municipal Ambiental (DIMA) in San Pedro Sula. Also *Aguas de Choluteca* through the *Mancomunidad de Guanacaure* is planning to initiate payment to manage the Guanacaure watersheds.

In a small subset of those municipalities selected to work with the MESA project, the project will begin the process of education needed to implement this new policy of charging users for the cost of managing the watershed. All three activities will be done in the same municipalities in order to ensure synergy.

Projected MESA Result(s): 1 set of validated guidelines produced and introduced to the 15 participating municipalities

Tasks:

1. From the catalog of priority watersheds selected by the project, select a subset of those where management has been initiated and in which the municipalities are most likely to embrace the development of guidelines, regulations and the payment for watershed services.
2. Create a working group that draws its members from these municipalities and is assisted by experts, in order to identify specific problems and draft guidelines and regulations for their solution.
3. Estimate the cost of managing the selected watersheds and analyze possible fee systems with the municipal and community leaders (mayors, *consejales municipales*, *juntas de agua*, *patronatos*, etc.).
4. Present to the public and discuss options of regulation and of charging water users for maintaining a healthy watershed.
5. Assist the working group in developing mechanisms by which the new fees that are obtained are channeled to pay for upstream interventions, such as fire protection, enforcement, agricultural extension and other activities that assure adequate watershed function.
6. Provide technical assistance for site-specific interventions to those municipalities that demonstrate application of the new guidelines.

Geographic Focus: A subset of the municipalities managing MESA priority watersheds, throughout the Choluteca and Rió Negro basins.

Lead implementer: Contractor or NGO with ample knowledge of municipal operations (prime candidate: FUNDEMUN)

Collaborators: The selected municipal administrations, SANAA, AHMON

Activity Prioritization

As stated earlier in this section, the 15 activities described above constitute a comprehensive set of activities for addressing water resources management in an integrated fashion across the entire river basin and with a full set of national counterparts and local partners. USAID/Honduras does not have to fund **all** 15 activities concurrently in all parts of the watershed. Likewise, it does not have to include all the 15 under the one project framework of MESA. It select to undertake its identified priorities and through its preferred programmatic structures, all the while accepting that, logically, these activities are addressing the MESA goals and objectives in a concerted way.

Recent Mission discussions, post Mesa Design Team visit in early September, indicate that the preferred option in the immediate term would be to consolidate and focus the activities in a more shorthand form and select to implement those most susceptible to funding and management within the exisiting Honduras portfolio and evolving strategy. The Table on the next page captures this re-prioritization as conducted by the mission and organized by the Cognizant Technical Officer.

In this case the nine (9) activities have been retained and reorganized into 5 themes:

- Availability of water resources data
- Protection of water sources
- Utilization of water resources
- Local governments Administration (of water resources)
- Public Awareness

The condensed organization of activities indicates the likely geographic areas and potential implementation partners for each block of activities. This reorganization is consistent with the detailed descriptions and presentations above. Below, the program design looks at the recommendations for the management structure and the budget that are part of the final MESA design.

MESA PROGRAM DESIGN - Prioritizations and Clustering (USAID/Honduras September 8, 2002)

Activity	Description		Geographical Location	Implementation
A. AVAILABILITY OF DATA				
1 Water resource data	Efficient collection , storage and distribution of credible hydrological information. Establishment of a national network of watershed management organizations (includes development and maintenance of a web page).		Nationwide	SERNA
B. PROTECTION OF WATER SOURCES				
1 Forest reserve management	Management of 3 protected areas: Guanacaure (2500 Ha), Hierbabuena (2200 Ha.), and Monserrat (3000 Ha.)		Lepaterique, Distrito Central, Yuscaran, Choluteca	VIDA, NGOs, SANAA
2 Natural forest management	Mgmt. of 6000 Ha. of natural forest in 6 municipalities		Yuscaran, Guinope, Maraita, San Antonio Ojojona, Lepaterique, Distrito Central	VIDA, Zamorano
C. UTILIZATION OF WATER RESOURCES				
1 Improve irrigation	Water use assessments of large users. TA to large producers. TA and grants to small producers.		Lepaterique, Moroceli Choluteca, Orocuina, Apacilagua, Marcovia,	Zamorano
2 Farm Soil & Water Conservation	Implement soil conservation and water management practices that will generate sustainability and productivity		12 Municipalities (-Ojojona, Choluteca, Triunfo)	Zamorano, NGOs
3 Water and sanitation systems	Assist SANAA 's regional office to become a demand-driven service organization that provides support to small rural water systems		Choluteca, Morolica, Marcovia, Apacilagua, Orocuina	SANAA
4 Small Grants Program	Approximately 100 grants to attend municipal, community and/or private proposals		Total program area	USAID, SANAA, Zamorano, VIDA
D. LOCAL GOVERNMENT'S ADMINISTRATION				
1 Local mgmt. Capacity	2 Municipal Associations, 10 municipalities and 20 Water Boards, executing improved water mgmt. Practices. Improved capacity to access credit and grants. Assist Municipalities to comply with water resouces legislation and to develop and apply proper water management regulations to its constituents.		15 Municipalities. The degree of involvement in each Municipality will vary according to its own particular issues. A pilot program to resolve water conflicts will be developed in the southern area. (Choluteca, Marcovia, Namasigue, El Triunfo)	Zamorano, NGOs
E. PUBLIC AWARENESS				
1 Public Awareness Program	Develop a public awareness campaign to foster water saving practices, reduce water pollution and bring water issues to the public attention.		Focusing on the Distrito Central and the Choluteca basin	VIDA, NGOs
Total				

IV. Proposed MESA Organizational Structure

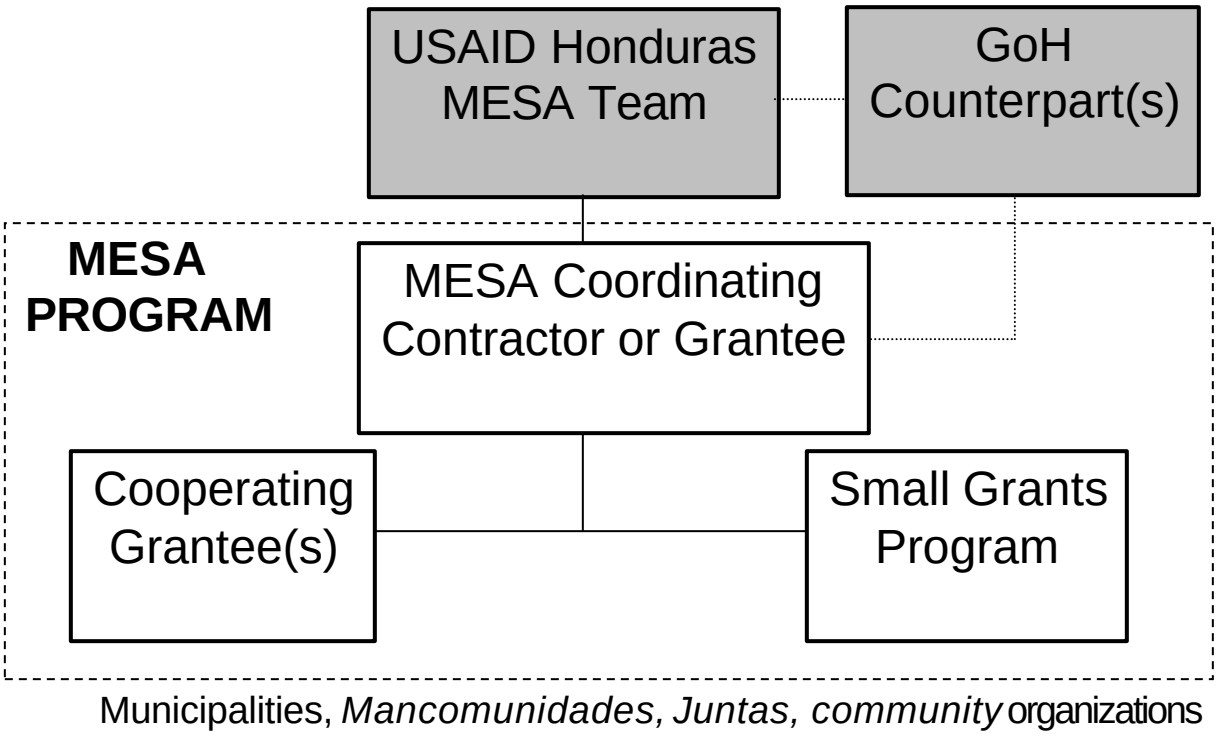
The implementation of the full set of activities affords USAID/Honduras with several options for mounting a well coordinated and closely supervised MESA program. Different scenarios were formulated and discussed with key Mission personnel during the design team's visits. The structure that follows attempts to incorporate the full preferences of the Mission teams and accommodates the requirements of MESA. Its overall design breaks down, not necessarily uniformly, into 3 coherent elements:

1) Intermediate Results 1 (application of technology) and 2 (strengthened local capacity): this work is significantly local resources management in nature (protected areas, forests, agriculture systems,) and is also largely delivered at the local-municipal-community level(s). The Mission has a lengthy record of working in this arena and with multiple local and international non-governmental organizations.

2) Intermediate Results 3 (education and advocacy) and 4 (policy and institutional development): this set of activities focuses on issues and activities that would require greater national level participation and are much more facilitative and institutional capacity-building in nature. The Mission has additional experience in this arena, but with a different set of more specialized institutions and firms.

3) A grants management component: MESA's creativity and ultimate success in the field will depend on its effective delivery of an accompanying grants program to foster parallel activities at every level. The Mission has some more limited experience in operating large grant components – mostly via experienced institutional contractors, a few local organizations (*Fundación Vida)* and one or two counterpart institutions (AHMON).

The structure below depicts a summary view of the proposed MESA organizational structure:



Base on experience with a similar portfolio of programs in USAID El/Salvador, the design team recommends that one coordinating entity be selected to implement MESA. This could be an institutional contractor or grantee. The mission has had positive experiences with both mechanisms. This lead agency would then be responsible for insuring the full implementation of MESA – all activities, across the 4 components (IR packages) and the three elements described above.

It is further recommended that additional sets of activities be executed via subgrants or subcontracts. The first element (IRs 1 and 2) can be implemented wholly by a qualified NGO or subdivided into two geographic zones (north and south) with two implementing subgrantees, e.g. Zamarano or *Fundación Vida*. The second element (IRs 3 and 4) can be implemented by other NGOs or firms more skilled in these areas.

The Small Grants Program represents a special case. In the *AGUA* Program in El Salvador, the water program contributes funding and technical assistance (technical officers time) to a Mission Small Grants facility. This handles all grant components centrally across a portfolio of USAID/El Salvador programs. This option is not available for the Honduras Mission at this juncture. Conversely, it has had success executing large grant programs through its institutional contractors (most recently with its UWR project) and smaller grant programs through experienced local non-governmental organizations like *Fundación Vida*. The compelling point to be made is that the MESA program overall must incorporate the Small Grants Program fully under its supervision to insure that it effectively supports MESA implementation. As noted, the Mission would have a couple options to structure this.

Illustrative Grant Activities:

IR Package 1 – Technologies
- Micro-watershed demarcation
- Fire protection training or equipment
- Water quality monitoring
- Private nurseries
- Water storage/catchment /conveyance
- Private forestry operations
- Tourism operations

IR Package 2 – Local Capacity
- Organizational/institutional training
- Water supply/sanitation construction
- Private water services (O&M)

IR Package 3 – Education and Public Awareness
- PR campaigns
- Environmental education (local)
- Organizational/institutional training
- Educational materials
- Conferences/Workshops/Exchanges

IR Package 4 – Policy and Legal Framework
- Water quality monitoring pilots
- Participatory Planning
- Organizational/institutional training
- Educational materials
- Conferences/Workshops/Exchanges

In summary, MESA can, and should, be implemented by the experienced firms already working in Honduras in the domain of natural resources management and institutional strengthening. Several qualified organizations can participate together under the direction of one lead agency. This agency would then report to the Mission MESA management team, whatever its final configuration.

Finally, the issue of counterpart identification is critical to an integrated water resources management effort. This is because so many institutions claim jurisdiction and/or responsibility for water resources under several banners. The design team's discussions across the board confirmed this confusion and interest. The on-going legislative process to redefine the water sector (4 new laws impacting water resources) indicates that the situation remains unclear and, to a certain extent, unstable. MESA should exercise care in working with the appropriate Honduran counterpart

institutions. With this in mind, MESA should concentrate its work at the counterpart level on two institutions:

1) Department of Water Resources (RRHH/SERNA) – RRHH is a key actor in national water resources planning and oversight, it is involved in many other similar programs, it seeks to assume ultimate responsibility for the nation's hydro-meteorological network, it is active in reformulating policy for the sector. It is a natural office to work directly with MESA in its implementation.

2) SANAA – While there is considerable discussion about its future SANAA is a key actor on the scene now in all of the Choluteca watershed, it has considerable investments and capacity to manage water for the capital, it houses regional centers for rural and peri-urban water supply, it intervenes in watershed management, water supply, sanitation and land use. It needs to be actively engaged with many of MESA's elements.

Two secondary counterpart institutions are important as well for MESA. These are COHDEFOR – across several of its units, active in forest, protected area and watershed management – and AHMON – an active counterpart for other large donor programs in the realm of municipal strengthening. While MESA should not engage them as full counterparts in the same sense as SERNA or SANAA, they have considerable capacity and particular interest in the work of MESA and can certainly be called upon to help advance its objectives.

V. Strategy for Sustainability of MESA Activities

It takes a long time to produce and observe the results of many water management activities, but, once established, they may continue to function indefinitely. For example, the improved management of a protected area might require 5 or more years before its impact on water flow and water quality was measurable. However, its positive effect will improve with time – as long as the improved management practices are maintained. Consequently the ultimate goal of sustainability is very important for a water management project, even for one with a short duration. The MESA sustainability strategy is based on the following considerations:

- The programmed duration of the MESA project is 3 years.
- The MESA project would not be starting from scratch: there are numerous initiatives that have been funded previously by USAID and other donors.
- Other donors are funding watershed management activities in Honduras and have plans to continue to do so in the future.
- Previous projects lacked a structured sustainability focus (possibly the result of 1980's geopolitical situation and of the emergency-type measures of the post Mitch projects).
- There has been very little organized information and experience-interchange between projects, with the result that there is duplication of effort and repetition of already-learned mistakes.
- There is an increasing national and international awareness of the need to improve watershed management, especially considering the increasing pressure on natural resources.
- Development organizations have become aware of the inherent instability of the centralized government institutions (owing principally to rapid turn-over of personnel) and, concomitantly, of the advantages of working with municipalities.

Consequently the MESA design is driven *a priori* to consider sustainability and incorporates the following principles:

- MESA should focus on strengthening local capacity for local actions. This means starting with the felt needs of the local relevant private and public institutions and progressively reinforcing their capacity to design and implement solutions.
- MESA should assist local institutions in building linkages to local technical assistance providers and also to funding sources (especially fee-paying water-users).
- MESA should attempt to increase the awareness of water consumers, citizens in general and especially decision makers about the real cost of obtaining water and their obligation to contribute to the protection of the upper watershed.
- MESA should utilize participatory methodologies for situation analysis, planning, evaluation and monitoring. Priority problems thus identified in the critical areas should be first on the work agenda.
- MESA should build on nascent models and initiatives. At the same time, through its monitoring and evaluation component, MESA should help improve the effectiveness of different institutions and create a platform for methodological and technical standardization.

- MESA should take advantage of its diverse activity mix to integrate interventions across the different sectors.

The above considerations have be incorporated into MESA's proposed 15 activities.

1.1 Support the local management of legally declared protected areas. Within this activity the project would work with 3 protected areas. Ideally each area should be managed by an independent and apolitical organization (e.g. AMITIGRA). At the same time, in order to obtain local support and authorization, it is important that this organization should evolve expressly from the individual or grouped public municipalities ('mancomunidades') involved.

1.2 Support the management of natural forests: The MESA project would improve the management of 6,000 ha of natural forest in 6 municipalities. The sustained impact of this activity implies supporting permanent production and processing options, which would be the incentive for improved forest management. For example, small businesses could be established to utilize thinnings. Improved forest management protects the watershed in real ways.

1.3 Improve the efficiency of irrigation: The MESA project would set up demonstrations of options of water-efficient irrigation systems. This is a government priority and PRONADERS would be the source of funding. The producers in the Choluteca plain have expressed their great interest in this type of technology. There are a few companies that are now supplying drip irrigation equipment. Sustainability of this activity could be achieved when the irrigation equipment suppliers take over the demonstration sites and assume a normal commercial role in promoting their products.

1.4 Foster the diversification of commercial, perennial crops: The MESA project goal is that 500 farms have increased their fruit tree area by an average of 0.25 ha. It is most unlikely that the planted trees will be cut down, especially if they have been purchased (albeit at reduced prices). However the continuance or expansion of the activity will depend on establishing local fruit tree nurseries, capable of producing good quality grafted trees at affordable prices.

1.5 Promote validated small-scale technology related to water-resource management in rural areas: A small-scale technology becomes locally sustainable once it has been adopted by a critical mass of convinced users. This rules out 'incentive-driven' extension systems and those that promote a large menu of technologies. It has proven much more effective to promote a very limited number of locally-validated technologies. Partial incentives can be given to the risk-taking innovators and early adopters, but the subsidy level should be progressively reduced with increasing adoption rates. By the time the 'critical mass' (generally 40% of potential users), new users should be obtaining the technology at commercial rates.

2.1 Improve the management and use of water resources data in Honduras: The MESA goal is to establish a hydro-meteorological network, using the data from 16 stations. The cost of maintaining this network is approximately $100,000 p.a. Considering the enormous worth of this data, the new 'Autoridad de Agua' or SERNA should be able to include this figure in its budget from 2006 onwards. MESA will try to demonstrate a viable, cost-effective operation and maintenance mechanism for the network.

2.2 Develop the local capacity for the management of water resources and watersheds: The MESA goal is for 2 'Mancomunidades', 10 municipalities and 20 community water user groups to implement management plans. The sustainability of this activity requires the development of local technical, administrative and fiscal expertise, as well as creating greater local awareness about water issues. It would be difficult to achieve this situation in just 3 years, especially considering the

lack of job stability of municipal employees (next elections: November 2005). However, this is an aspect that will continue to receive attention from other projects.

2.3 Develop the local capacity to operate and maintain critical water and sanitation systems: The MESA goal is to create 1 municipal O & M system with 'Aguas de Choluteca' and 1 regional system with SANAA. Sustainability after the project terminates will depend on the users' capacity and willingness to pay for the service. The mass media activity will attempt to increase public awareness about the obligation to contribute (via their water bill) towards this service.

3.1 Improve Environmental Education in Schools: The real sustainability of this activity depends on the willingness of the Ministry of Education to incorporate environmental education into the primary school curriculum effectively. Up to the present many institutions have experimented, but there has been no comparative analysis or consolidated inter-institutional proposal to present to the Ministry. In its 3 year duration, MESA will conduct a comparative study, which it will then present to environmental education institutions in a symposium. On the basis of their shared experiences, the participant institutions could prepare a set of new guidelines on environmental education.

3.2 Use mass media and advocacy to change attitudes and behavior concerning water resources: This activity will only be sustainable if commercial sponsors continue to pay for advertisements with water resources messages incorporated.

3.3 Support information interchange via a network of actors involved in water resource management This useful activity could be sustained through the contributions of the participant institutions and members. An increasing participating tariff could be agreed upon in the second year.

4.1 Promote the creation of mechanisms to resolve water conflicts. The MESA goal is to pilot a water forum in Choluteca, where various users are headed for a large conflict. Since the problem is continuous and fundamental, it is hoped that the forum would become a permanent body.

4.2 Create a financial mechanism to finance new works in water and sanitation: It is intended that the financial institutions involved will continue to this activity.

4.3 Assess the financial feasibility at the municipal level for compliance with the full package of local water law. This direct activity is only sustainable in the measure that interested parties (such as SANAA, AMON, donors and others) recognize the importance of having hard data before creating and approving laws, donors. Compliance will not be feasible until the legislation is realistic.

4.4 Develop guidelines and/or regulations for water resource management at the municipal level: The validated guidelines document in itself should be an important contribution to all the municipalities in Honduras. This activity would be organized by AMON and replicated nationally.

VI. Logical Framework for Monitoring and Evaluation

Much has been written on how watershed and water resources management programs have been traditionally evaluated. In general, the practice has been to focus on the project's outputs (hectares under management or dams built) or on specific and related economic development indicators (household incomes or enterprise creation). This has been at the expense of the standard hydrologic indicators of water quality (physical, chemical or biological) and water quantity. In fact these are very difficult to measure with any degree of certainty across a basin – e.g. even with accurate stream flow gauging, it is impossible to attribute project interventions with influencing watershed production against a very dynamic natural meteorological or climatic regime working on a very large scale.

Still, it is very worthwhile to undertake measuring hydrologic variable on a micro-scale. The MESA project will support monitoring of these basic hydrologic variables: **physical** – dissolved or suspended solids, temperature and stream flow; **chemical** – dissolved oxygen, alkalinity and pH; and **biological** – aquatic species composition, bacteria counts, biological oxygen demand. These are excellent indicators of a micro watershed's overall status and are relatively easily tracked. USAID programs should consider adopting these wherever appropriate. Simple and modern methods of analysis have brought such testing into the economical range for development programs and, more importantly, has facilitated local community access to monitoring programs. The MESA strategy will be to use this strategy to monitor local interventions – sanitation works, potable water systems, water harvesting, protected area improvements, road-building, etc. This is an effective way to foster stakeholder participation, advance environmental education, inform advocacy efforts and insure local compliance.

On a large program implementation level, the MESA design team is proposing a complete performance monitoring framework. The full details for each Intermediate Result (components) and for each associated activities follow in the four tables below. The framework includes both the quantifiable outputs and a set of potential indicators of the longer term impact of each activity. The MESA program team should insure that the eventual implementers (contractors and/or grantees) pay special attention to incorporating explicitly these output and impact indicators in their eventual MESA programs. It is only through aggressive attention to these indicators, and through the incorporation of a monitoring and evaluation protocol into their implementation, that the full measure of MESA's success(es) will be determined in the end.

IR 1: Increased access to and application of technology for efficient water use and management

Activity:	Expected results:	Impact Indicator(s):
1. Support the local management of legally declared protected areas	3 protected areas (Guancaure, Hierba Buena and Monserrat = 7,750 Ha.) managed by functional, independent entity in collaboration with local and national authorities (La Tigra model).	• Reduced losses to fire • Reduced illegal logging • Reduced encroachment (or loss of integrity) • Maintenance of water quality
2. Support the local management of natural forests	6000 Ha. of natural forest in 6 municipalities managed through active engagement of community organizations, local enterprise and producer associations.	• Reduced losses to fire • Reduced illegal logging • Reduced encroachment (or loss of integrity) • Maintenance of water quality • Increased enterprise development
3. Improve the efficiency of irrigation in upper and lower Choluteca basin	4 drip irrigation demonstration units established in the Orocuina, Marcovia, Lepaterique and Moroceli in cooperation with local enterprise.	• Reduced water consumption • Increased productivity • Increased producer incomes • Increased enterprise development
4. Foster the diversification of commercial (perennial) crops	500 farms have each increased fruit tree area by an average of 0.25 hectares.	• Increased tree cover • Increased producer incomes • Increased family food security • Increased enterprise development
5. Promote validated small-scale technology related to water resource management in rural areas.	3000 farms use of an average of 3 validated technologies (including rock wall barriers, stream protection structures, vetiver live barriers, fuel efficient stoves and water storage for human, cattle and irrigation use.	• Increased water availability • Increased soil fertility • Reduced logging (for firewood) • Increased producer incomes • Increased family food security

IR 2: Strengthening the institutional capacity for integrated water resources management

Activity:	Expected results:	Impact Indicator(s):
1. Improve the management and use of water resources data in Honduras	1 functioning hyrdo-meteterological being maintained in the Choluteca basin with reliable data being distributed to legitimate users and clients.	• Flood early warning system for basin • Application of data to other development problems • A model for similar technical networks in other areas
2. Develop the local capacity for the management of water resources and watersheds	2 *Mancomunidades*, 10 municipalities and 20 Juntas *Administativas de Agua* implementing locally formulated and supported management or development plans.	• Long term water resources development plans for >32 sites • Increased potable water (improved health) • Decreased water pollution (improved health) • Strengthened local organizations/institutions
3. Develop the local capacity to operate and maintain critical water and sanitation systems	1 municipal O & M system in operation (Aguas de Choluteca), providing service to >4 major water systems, 1 regional O & M system in operation (SANAA), providing service to >25 rural water systems.	• Improved sustainability of water supply/sanitation systems • Increased potable water (improved health) • Decreased water pollution (improved health) • Strengthened local organizations/institutions

IR 3: Increased public awareness of water resource issues

Activity:	Expected results:	Impact Indicator(s):
1. Improve Environmental Education in Schools	2000 primary school students participating in structured environmental education system, 1 environmental education comparative study conducted with/among 12 education institutions.	• Improved knowledge, attitudes and practices • Improved capacity of participating education institutions • Improved model for environmental education
2. Use mass media and advocacy to change attitudes and behavior concerning water resources	18 newspaper articles published in national press in 3 years, 2 once-weekly environmental radio programs (or sections) transmitted during 2 years.	• Increased awareness of water resources and environmental issues • Increased awareness among policy makers
3. Support information interchange via a network of actors involved in water resource management	1 web page established and functioning, 1 symposium per year (total 3)	• Increased information for Honduran professionals • Improved interchange among Honduran professionals

IR 4: Improving the legal and policy framework for water resources management

Activity:	Expected results:	Impact Indicator(s):
1. Promote the creation of mechanisms to plan for regional water resources development	1 regional Water Forum established (Chluteca, Marcovia, El Triunfo and Namasigue) for planning, development and administration of water resources	• Improved capacity to manage water resources locally • Introduced mechanisms to avoid conflicts • Improved local governance • Model for multi-jurisdiction management of water for other areas
2. Create a financial mechanism to finance new works in water and sanitation	1 financial mechanism established to facilitate construction of new works in water and sanitation	• Increased construction of water supply and sanitation systems (improved health) • Improved capacity of participating institutions
3. Assess the financial feasibility at the municipal level for compliance with the full package of local water law	1 study completed and distributed to water resource related institutions and donors	• Realistic expectations established for local participation and performance
4. Develop guidelines and/or regulations for water resource management at the municipal level	1 set of validated guidelines produced and introduced to the 15 participating municipalities	• Increased local capacity to manage water resources • Improved governance • Improved application of the set of existing Honduran laws and policies

VII. Tentative Implementation Calendar

The following table presents a hypothetical implementation calendar for MESA. It is based on the assumption that the model of one core MESA implementing team (institutional contractor supervising the selected grantees and overseeing the grant fund). More complex management structures would require more time to install to operational levels. It also assumes that the complete range of activities would be implemented. Changes to this activity set would similarly alter the schedule below. The implementation plan is purposely general in character. Institutional contractors and/or grantees would be required to present more detailed work plans within the scopes of their contracts or grants.

MESA Projected Implementation Calendar – Three years (by quarters)

	Year 1				Year 2				Year 3			
Activity	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**
MESA core team installation	x											
MESA core team supervision		x	x	x	x	x	x	x	x	x	x	
MESA core team project close down												x
Activity 1.1: Support management of protected areas												
Consult /educate local population and organizations		x										
Carry out demarcation of protected areas			x									
Setting up and training of unit protection units				x								
Create, train and deploy cadre of guards				x	x	x						
Organize communities				x	x	x						
Propose financial mechanism							x					
Persuasion of inhabitants to improve land use.							x	x	x	x		
Assist local communities - matching grants								x	x	x	x	
Activity 1.2: Support the management of natural forests.												
Select forests,with potential for sustainable production.		x										
Identify and motivate legally organized groups.		x										
Educate stakeholders			x	x			x				x	
Assist preparing management plans				x	x							
Train and advise groups in technical matters				x	x	x	x	x	x	x	x	
Assist management groups in business matters.								x	x	x	x	
Assist management groups with harvesting operations.						x	x	x	x	x	x	
Assist groups in purchasing small sawmills.								x	x			
Support fire prevention groups				x	x	x	x	x	x	x	x	

Activity	I	II	III	IV	I	II	III	IV	I	II	III	IV
Activity 1.3: **Improved Irrigation Efficiency**												
Identify different irrigation systems.		**x**										
Establish demonstration sites.			**x**	**x**	**x**	**x**	**x**					
Monitor the process and results.				**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	
Activity 1.4: Foster diversification of commercial, perennial crops												
Select specific perennial crops.		**x**										
Identify possible marketing s.		**x**	**x**	**x**								
Assist establishing nursery businesses				**x**	**x**	**x**	**x**					
Provide processing equipment							**x**	**x**				
Improve product presentation.								**x**	**x**			
Provide technical assistance.				**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	
Activity 1.5: Promote validated small-scale technology												
Identify sites and communities.		x										
Carry out survey of potential technologies		x										
Design structures			x	**x**	**x**							
Apply for financing				**x**	**x**	**x**						
Construct structures					**x**	**x**	**x**	**x**	**x**			
Validate and demonstrate soil conservation practices			x	**x**	**x**	**x**						
Select and train local technical leaders			x	**x**	**x**	**x**						
Organize experience interchange events						**x**	**x**	**x**	**x**	**x**	**x**	

Activity 2.1: Improve the management and use of water resources data in Honduras												
Select implementing partner		**x**										
Provide necessary technical assistance			**x**	**x**	**x**	**x**	**x**					
Inform and orient potential data users					**x**	**x**	**x**	**x**	**x**			
Expand data collection								**x**	**x**	**x**	**x**	
Activity 2.2: Develop local capacity to manage water resources and watersheds												
Strengthen the UMAs planning capacity		**x**	**x**									
Provide necessary technical assistance			**x**	**x**	**x**	**x**						
Educate mayors and other local leaders			**x**	**x**	**x**	**x**	**x**	**x**	**x**			
Assist municipalities - formal declaration					**x**	**x**						
Promote agreements between municipalities				**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	
Training events		**x**		**x**		**x**		**x**		**x**		
	Year 1				**Year 2**				**Year 3**			

Activity	I	II	III	IV	I	II	III	IV	I	II	III	IV
Activity 2.3: Develop local O & M capacity for critical water and sanitation systems												
Provide tec/financial assistance SANAA			x	x	x	x	x	x	x			
Provide tec/fin assistance Agua de Choluteca			x	x	x	x	x	x	x			
Help set up financial mechanisms								x	x	x	x	
Activity 3.1: Improve Environmental Educ												
Select participating schools		x										
Print teacher guides /support materials		x	x									
Train local teachers			x	x			x					
Prepare individualized chronological plan				x	x							
Monitor of program activities					x	x	x	x	x	x		
Interchange meeting with collaborating											x	
Activity 3.2: Use mass media												
Carry out survey of radio and tv programs		x										
Create, locate and distribute material			x	x	x	x	x	x	x			
Create and distribute tips for newspapers		x	x	x	x	x	x	x	x	x	x	
Carry out local awareness raising actions		x	x	x	x	x	x	x	x	x	x	
Evaluate audience levels						x				x		
Activity 3.3: Support information interchange via a network												
Equip the selected institution.		x										
Maintain and update the existing database.			x	x	x	x	x	x	x	x	x	
Invite actors to join the network		x	x	x			x				x	
Distribute selected documents				x	x	x	x	x	x	x	x	
Establish and maintain a web page				x	x	x	x	x	x	x	x	
Activity 4.1: Promote the creation of mechanisms to resolve water conflicts												
Identify stakeholders and construct forum		x										
Collective educn on water resources devel.		x	x									
Acquire hydrologic data, etc.			x	x	x	x						
Debates and about water resource plan						x	x					
Complete a regional water resources plan							x	x				
Activity 4.2: Create a financial mechanism to finance new works in water/ sanitation												
Negotiate credit guarantee			x									
Educate municipalities and water authorities				x	x	x	x					

	Year 1				Year 2				Year 3			
Activity	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**	**I**	**II**	**III**	**IV**
Activity 4.3: Assess the financial feasibility for compliance of local water law.												
Contracting of study			**x**									
Carry out the evaluation				**x**	**x**							
Discuss results with municipalities and others						**x**						
Disseminate the final results							**x**					
Activity 4.4. Develop guidelines and/or regulations for water resource management												
Select priority watershed				**x**								
Create a working group.					**x**							
Estimate the cost of managing (participative)						**x**	**x**					
Present to the public and discuss.							**x**	**x**				
Assist working group in developing proposal								**x**	**x**	**x**		
Provide t.a. for site-specific interventions									**x**	**x**	**x**	**x**

VIII. Illustrative MESA Budget

The proposed activity set (section IV above) and organizational structure (Section V) provide the basis for estimating a MESA budget. These figures are derived from similar work done by grantees and institutional contractors in the past and represent the best "guesses" by the MESA design team's collective experience. The actual professional time, related administrative and logistic costs, associated equipment and vehicle expenses, overheads, and fees are very difficult to specify at this moment. Much will hinge on the final packaging of the activity set in its components, geographical locations and the mechanisms selected (grants or contracts) to implement MESA. However, these estimates below should provide USAID program staff with legitimate benchmarks against which to address the questions of resource allocations and scale of eventual implementation.

Activity 1.1: Support management of Three (3) protected areas

Site office buildings and equipment (3)	125,000.00
Access road (3)	125,000.00
Delimitation materials	60,000.00
Unit management teams (2 per team, 3 teams, 2.5 years)	105,000.00
Guards 4 guards per unit, 3 units, 2.5 years)	75,000.00
Land use incentives	50,000.00
Technical assistance (1 visit per site per week, 3 years)	60,000.00
Total	**$600,000.00**

Activity 1.2: Support the management of natural forests

Equipment and materials	60,000.00
Technical assistance (2 visits per site per month – 60 sites of 100 ha each, = 10 technicians X 3 years X $1500/month X 16 months per year) – includes mileage and admin.	660,000.00
Fire prevention groups	60,000.00
Processing technical assistance	20,000.00
Total	**$800,000.00**

Activity 1.3: Improve Irrigation Efficiency

Equipment and materials (4 sites X $2000 per site)	8,000.00
Technical assistance (4 visits per site per month – 4 sites for 1.5 yea, = 1 technician X 1.5 years X $2000/month	48,000.00
Field days – publicity	4,000.00
Total	**$60,000.00**

Activity 1.4: Foster perennial crop diversification

Equipment and materials - nurseries	14,000.00
Specific Nursery Technical assistance (4 visits per area per month – 4 areas for 8 months = 1 technician X $2000/month (includes mileage and admin)	16,000.00
Total	**$30,000.00**

Activity 1.5: Promote validated small-scale technologies

Equipment and materials (3 sites X $2600 per site)	8,000.00
Technical assistance (8 visits per water-user group per month – total 40 groups for 2.5 years = 15 technician X 2.5 years X $1500/month	787,000.00
Field days – publicity	5,000.00
Total	**$800,000.00**

Activity 2.1: Improve Data Collection and Use

16 sites X $6000 p.a. for 3 years	288,000.00
Other equipment, data use training	62,000.00
Total	**$350,000.00**

Activity 2.2: Develop the local capacity for the management of water resources

Equipment and materials (10 offices X $1000 per office)	10,000.00
Technical assistance (6 visits per water-user group per month – total 35 groups for 2.5 years = 15 technician X 2.5 years X $1600/month (includes mileage and admin)	840,000.00
Specialized technical assistance	25,000.00
Training , field visits	25,000.00
Total	**$900,000.00**

Activity 2.3: Develop the local O & M capacity

Equipment and materials SANAA	100,000.00
Equipment 'Aguas de Choluteca'	100,000.00
Personnel SANAA (3 technicians)	120,000.00
Personnel 'Aguas de Choluteca' (3 technicians)	120,000.00
Specialized technical assistance	10,000.00
Total	**$450,000.00**

Activity 3.1: Improve Environmental Education

Teacher and student materials ($10.00 per student)	20,000.00
Teacher training (100 teachers, 3 events @ $40/day)	10,000.00
Technical assistance, supervision	50,000.00
Monitoring and evaluation	6,000.00
Experience interchange meeting	4,000.00
Total	**$90,000.00**

Activity 3.2: Use Mass Media

18 newspaper articles @ $2,000	36,000.00
2 radio programs supported	76,000.00
Audience evaluation	8,000.00
Total	**$120,000.00**

Activity 3.3: Support Information Interchange via Web Page

Equipment	9,000.00
Web page ($20 per month, plus $50 annual registration)	1,000.00
Writer/editor(3 years)	40,000.00
Total	**$50,000.00**

Activity 4.1: Regional Water Resources Development Mechanism

Equipment, data collection, studies	40,000.00
Discussion forum	10,000.00
Specialized technical assistance	50,000.00
Total	**$100,000.00**

Activity 4.2: Create Financial Mechanism

Equipment, data collection	50,000.00
Other costs	10,000.00
Total	**$60,000.00**

Activity 4.3: Compliance Cost Study

Carry out study	50,000.00
Dissemination of results	10,000.00
Total	**$60,000.00**

Activity 4.4: Water Resource Guidelines Development

Carry out study	40,000.00
Dissemination of results	10,000.00
Specialized technical assistance	10,000.00
Total	**$60,000.00**

Grant Program

Up to 100 grants of an average of 15,000	
Total	**$1,500,000.00**

Technical Assistance (Institutional Contractor Model)

This would be a 3-person technical team (COP plus 2 specialists), administrative assistant and secretary, to cover the grant management, supervision of grantee, including 20 person months of undetermined additional short-term technical assistance, for 36-month implementation, estimated from prevailing rates	
Total	**$2,400,000.00**

Vehicles

8 4-wheel drive vehicles (imported)	
Total	**$280,000.00**

Other equipment

Miscellaneous computers, hydrological equipment, GIS equipment, acquisition of remote imagery, etc
Total **$100,000.00**

Illustrative Budget Summary

Activity	Description	Cost
1.1 Forest reserve management	3 protected areas managed by independent management units in Guancaure, Hierba Buena and Monserrat	$600,000.00
1.2 Natural forest management	Improved management of 6000 Ha. Of natural forest in 6 municipalities	$800,000.00
1.3 Improve irrigation efficiency	4 drip irrigation demonstration units established in the Orocuina, Marcovia, Lepaterique and Moroceli	$60,000.00
1.4 Crop diversification	500 farms have each increased fruit tree area by an average of 0.25 Ha	$30,000.00
1.5 Small scale technology transfer in selected microwatersheds	Use of an average of 3 validated technologies (including fuel efficient stoves, rock wall barriers, stream protection structures, vetiver live barriers and water storage for human, cattle and irrigation use in 3000 farms	$800,000.00
2.1 Water resource data improvement	A functioning hidro-met network established, using data from 16 stations 3 years	$350,000.00
2.2 Local management capacity improvement	2 Mancomunidades, 10 municipalities and 20 Juntas de agua applying locally formulated management plans	$900,000.00
2.3 Maintenance service capacity	1 municipal O & M system in operation (Aguas de Choluteca), providing service to 4 major water systems 1 regional O & M system in operation (SANAA), providing service to 25 rural water systems	$450,000.0
3.1 Environmental education	2000 primary school students participating in structured environmental education system Environmental education comparative study socialized amongst 12 education institutions	$90,000.00
3.2 Mass media use	18 newspaper articles published in national press in 3 years 2 once weekly environmental radio programs (or sections) transmitted during 2 years	$120,000.00
3.3 Web page	Web page established and functioning 3 symposiums (1 p.a)	$50,000.00

Illustrative Budget Summary (cont.)

Activity	Description	Cost
4.1 Water conflict Solving	1 regional forum established (Chluteca, Marcovia, El Triunfo and Namasigue)	$100,000.00
4.2 Financial mechanism	Financial mechanism established	$60,000.00
4.3 Assessment of compliance cost	1 Study completed and socialized	$60,000.00
4.4 Guidelines and regulations development	1 set of validated guidelines produced	$60,000.00
Grants	100 grants	$1,500,000.00
Technical assistance team	COP, field assistant, monitoring specialist, administrative assistant, receptionist and 20 person-months of short term ta	$2,400,000.00
vehicles	8 4-wheel drive vehicles	$280,000.00
other equipment		$100,000.00
Total		$8,810,000.00

Prioritizing through Budget Allocations

The Mission staff and MESA Design Team debated the relative weight o f individual activities and components that might be assigned through a budgeting process. Clearly, choosing to finance one activity set over another is a way for USAID to prioritize its interventions, both thematically and geographically. The summary above simple recaps the general detailed budget notes presented above.

The Table on the right results from the early September meeting of Mission personnel to look at assigning priorities through budget allocation under a potential MESA program. At this juncture, these assignments are arbitrary. However, they serve to illustrate MESA's intention to support some very specific options within the activity set that comprises MESA. Here for example, a much higher accent would be placed on developing more productive irrigated agriculture technologies. These allocation decisions rest with the Mission MESA program managers as it moves more concretely towards implementation.

Activity	Cost
1 Water resource data	$600,000
1 Forest reserve management	$900,000
2 Natural forest management	$900,000
1 Improve irrigation	$600,000
2 Farm Soil & Water Conservation	$600,000
3 Water and sanitation systems	$600,000
4 Small Grants Program	$1,500,000
1 Local mgmt. Capacity	$900,000
1 Public Awareness Program	$900,000
Total	**$7,500,000**

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X. MESA Design Team Honduras Contacts – August 6 – August 28, 2002

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COSUDE – Yadira Resinos
Fundacion Vida – Jorge Quiñonez, Napoleon Marazan, Orlando Ortiz, Francisco Abarca
Fundacion de Municipios de Honduras – Mirtha Gonzales, Thelma Cabrera
SANAA, Departmento de Cuencas – Rigoberto Romero Mesa, Manuel Antonio Trinidad
SANAA, Regional de Sur (Choluteca), Acueductos Rurales –Néstor Chavez
SANAA, Regional de Sur (Choluteca), Program de Operación y Mantenimiento – Manuel Trinidad
SERNA, Dirección General de Recursos Hídricos – Franklin Amaya, Allan Bendeck
SERNA, Dirección General de Recursos Hídricos, Enlace Inter-institucional – Carlos Martinez
SERNA, Dirección de Biodiversidad – Erika Villagran
Ministerio de Gobernació, Ordennimiento Territorial – Jose Reyes Chirinos
Pan American Agriculture School (Zamarano) – Peter Dolye, Marty Swartz, Myra Falck, Robert Walle
Pan American Agriculture School (Zamarano Staff Field Trip) – Luis Caballero, Nelson Gamero
AFE-COHDEFOR, Dirección de Gestión Ambiental – Selvin Zelaya
AFE-COHDEFOR, Dirección Sistema Social Forestal– Franciso Borjas
AFE-COHDEFOR, Unidad de Cuencas Hidrograficas – Didi Portillo
AFE-COHDEFOR, Dirección – Gustavo Morales, Atilio Ortiz
IDB, MARENA Project - Mateo Molina

NGOs

Ayuda en Acción (Choluteca) – Lot Tabora, Marco Pirel, Natividad Flores,
Grupo Collaborativo de Agua y Sanemiento (forum with representatives from 15 local organizations) – Umberto Puerto

Municipalities

El Triunfo – Santos Piraeda Mondragón, Alcalde
Yusguare – Arturo Villalobos, Vice-Alcalde
Moreceli – Gustavo Uclés, Alcalde
Maraita – Reyna Lagos, Alcaldesa
Tatumbla – José Victor Vasquez, Alcalde
Soledad – Alcalde
Marcovia – Felipe Zepeda, Alcalde

Private Sector

Cooperativo de Procesadoras de Marañon, Namasigue
EXCOSUR (melon exporters), Marcovia – Alejandro Castillo
La Grecia (cane and sugar producers), Marcovia – Alex Moscozo, Wiland Gundersen

XI. Documents Archived in Annexes (CD-ROM)

Annex One

I Concept Paper, April 2002, Final

II MESA Design Terms of Reference

III New Activity Document – USAID – S.MURRARY – R.ALVAREZ

Annex Two

I FOLDER CATIE II - Estudio de Factibilidad y Diseño Programa de Manejo de Recursos Naturales en Cuencas Prioritarias (select "autorun.exe")

II FOLDER NEW HONDURAN WATER LEGISLATION - Four Pending Laws on Water and Natural Resources

III FOLDER TSCHINKEL GUATEMALA WATERSHED LESSONS LEARNED – One summary report: Spanish version and English version

IV FOLDER SANAA – Two PowerPoint presentations - Abastecimiento de Agua a Tegus and Estado actual de las cuencas

V. FOLDER ZAMARANO – Choluteca Upper Watershed Rehabilitation Final Report

V Estatutos Amuprolago (Manucomunidad)

VI Experiencia BID Cuencas (Report)

VII Lessons Learned in DAI UWR Project (Report)

VIII MESA Design Report L. Garcia – Conclusiones y Recomendaciones (Report)

IX MESA Design Report L. Moncada – Hallazgos Criticos (Report)

X Orientation of Watersheds for USAID-HON2 (Report)

XI Final Report – Hacia un Manejo Integrado de los Recursos Hidricos en Honduras